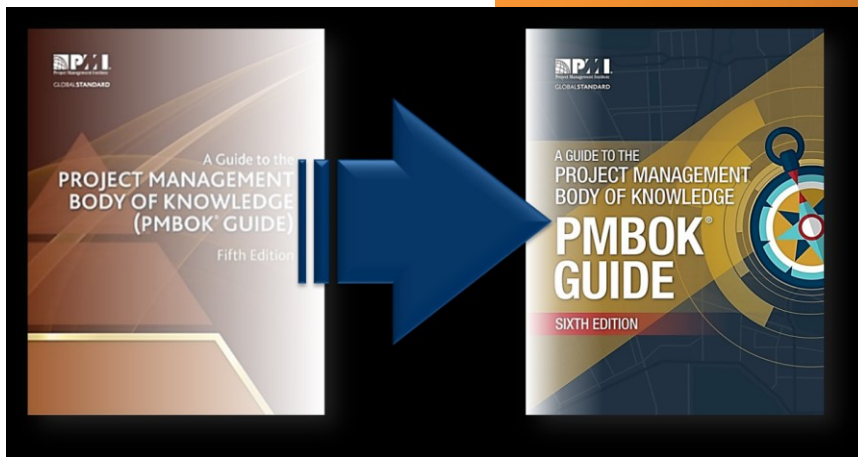


What is New in the *PMBOK Guide*® 6th Edition - an In-Depth Comparison



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CONTENTS

CONTENTS	2
NOTIFICATIONS	5
Disclaimer	5
Content and Updates	5
SUMMARY OF MAJOR CHANGES	6
PMBOK® Guide 5th Edition to 6th Edition	6
In a Nutshell	6
Process Groups	6
Knowledge Areas	6
Processes	6
Knowledge Area Information	7
PMBOK® Guide 5 th Edition Project Framework	11
Detailed Analysis	12
CHAPTER 1	12
Introduction	13
1.1 Overview and Purpose of the PMBOK® Guide	13
1.2 Foundational Elements	13
CHAPTER 2	18
2.1 Overview	18
2.2 Enterprise Environmental Factors	18
2.3 Organizational Process Assets	19
2.4 Organizational Systems	20
CHAPTER 3	23
3.1 Overview	23
3.2 Definition of a Project Manager	23
3.3 The Project Manager’s Sphere of Influence	23
3.4 Project Manager Competencies	25
3.5 Performing Integration	28
SUMMARY OF MAJOR CHANGES: CHAPTERS 4 – 13	30
Additional Sections	30
Input and Output Changes	30
Project Management Plan Components	30
Project Documents	30
CHAPTER 4: Project Integration Management	31
4.1 Develop Project Charter	31
4.2 Develop Project Management Plan	32

4.3 Direct and Manage Project Work.....	33
4.4 Manage Project Knowledge	34
4.5 Monitor and Control Project Work.....	37
4.6 Perform Integrated Change Control	39
4.7 Close Project or Phase.....	40
CHAPTER 5: Project Scope Management.....	43
5.1 Plan Scope Management	43
5.2 Collect Requirements.....	44
5.3 Define Scope	47
5.4 Create WBS	48
5.5 Validate Scope.....	49
5.6 Control Scope.....	50
CHAPTER 6: Project Time Management changed to Project Schedule Management.....	5251
6.1 Plan Schedule Management	5251
6.2 Define Activities	5352
6.3 Sequence Activities	5453
Estimate Activity Resources (5 th Ed – Moved)	5554
6.4 Estimate Activity Durations.....	5655
6.5 Develop Schedule.....	5857
6.6 Control Schedule.....	6059
CHAPTER 7: Project Cost Management	6261
7.1 Plan Cost Management.....	6261
7.2 Estimate Costs.....	6362
7.3 Determine Budget.....	6463
7.4 Control Costs.....	6665
CHAPTER 8: Project Quality Management.....	6867
8.1 Plan Quality Management	6867
8.2 Manage Quality.....	7069
8.3 Control Quality.....	7372
CHAPTER 9: Project Resource Management.....	7674
9.1 Plan Human Resource Management changed to Plan Resource Management.....	7674
9.2 Estimate Activity Resources	7876
9.3 Acquire Project Team to Acquire Resources.....	7977
9.4 Develop Project Team changed to Develop Team.....	8280
9.5 Manage Project Team changed to Manage Team	8583
9.6 Control Resources	8684
CHAPTER 10: Project Communications Management changed to Project Communication Management	9088
10.1 Plan Communications Management changed to Plan Communication Management.....	9088

10.2 Manage Communications	9290
10.3 Control Communications changed to Monitor Communication	9391
CHAPTER 11: Project Risk Management	9694
11.1 Plan Risk Management	9694
11.2 Identify Risks	9795
11.3 Perform Qualitative Risk Analysis	9997
11.4 Perform Quantitative Risk Analysis.....	10199
11.5 Plan Risk Responses	103101
11.6 Implement Risk Responses	105103
11.7 Control Risks changed to Monitor Risks	106104
CHAPTER 12: Project Procurement Management	109106
12.1 Plan Procurement Management.....	109106
12.2 Conduct Procurements	112109
12.3 Control Procurements.....	114111
Close Procurements (5 th Ed – Removed)	116113
CHAPTER 13: Project Stakeholder Management.....	117114
13.1 Identify Stakeholders	117114
13.2 Plan Stakeholder Management changed to Plan Stakeholder Engagement.....	119116
13.3 Manage Stakeholder Engagement.....	121118
13.4 Control Stakeholder Engagement changed to Monitor Stakeholder Engagement	123120
CONTRIBUTORS.....	126122
Asad Naveed, PMP, RMP, MEF-CECP	126122
Erjola Mimani, PMP®, PSM I	126122
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Steve Blash, MA, PMP®, PMI-ACP	129125
Varun Anand, PMP®, CSM.....	129126

NOTIFICATIONS

Disclaimer

The contents of this eBook are intended to assist the reader in becoming familiar with the changes from the Fifth to Sixth Edition found in the Project Management Institute's *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*.

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Content and Updates

Readers are welcome to send their suggestions for improvements, modifications, or etc. in this document to Asad Naveed (Email: asadnaveed@hotmail.com) or any of the contributors listed at the end of this eBook. Any significant, accepted contribution will be formally given credit in this document as "Reviewer."

SUMMARY OF MAJOR CHANGES

PMBOK® Guide 5th Edition to 6th Edition

In a Nutshell

The first three sections (Sections 1 – 3) of the 5th edition of the *PMBOK® Guide* have been completely revised, while relevant information in the previous editions were retained. New information reflecting the evolution of our profession as a driver of organizational change and a means of providing business value were also added.

The Sixth Edition incorporates terminology and practices that reflects the larger, more inclusive spectrum of project management practices. This is especially present in Section 1, where the project and development life cycles are discussed, as well as the various Agile, Iterative and Adaptive project approaches, which are referred to throughout the Knowledge Areas (Sections 4 -13).

Section 3 discusses the Role of the Project Manager, including topics on how project managers operate in various organization environments and the skills and competencies they need to be effective.

Process Groups

The Process Groups remain the same in the Sixth Edition

Knowledge Areas

The names of two of the Knowledge Areas have been changed slightly.

- Project Time Management is now **Project Schedule Management**, emphasizing the importance of scheduling in project management. This aligns with PMI's Practice Standard for Scheduling.
- Project Human Resource Management is now **Project Resource Management**, which now includes the management of both team resources and physical resources.

Processes

New Processes

There are three new processes in the Sixth Edition:

- **Manage Project Knowledge**, which is now included as part of the Executing Process Group and Project Integration Management knowledge area.
- **Implement Risk Responses**, which is now included as part of the Executing Process Group and Project Risk Management knowledge area.
- **Control Resources**, which is now included as part of the Monitoring and Controlling Process Group and Project Resource Management knowledge area.

Minor Process Changes

Estimate Activity Resources is still part of the Planning Process Group, but it is now been associated with the Project Resource Management processes instead of an activity within the Project Schedule Management processes.

Some processes have been renamed to align the process with its intent. This reflects the overall change from project managers controlling project activities to that of monitoring the overall project activities.

The table below shows the process name changes that have been made.

PMBOK 5th Edition		PMBOK 6th Edition
Perform Quality Assurance	→	Manage Quality
Plan Human Resource Management	→	Plan Resource Management
Acquire project Team	→	Acquire Resources
Develop Project Team	→	Develop Team
Manage Project Team	→	Manage Team
Control Communications	→	Monitor Communications
Control Risks	→	Monitor Risks
Plan Stakeholder Management-	→	Plan Stakeholder Engagement
Control Stakeholder Engagement	→	Monitor Stakeholder Engagement

Deleted Processes

The Close Procurement process has been removed and portions have now been moved to Control Procurements and other portions to the Close Project or Phase process.

Research shows that few project managers have the authority to formally and legally close a contract. On the other hand, project managers are responsible to determine that work is complete, records are indexed and archived, and responsibilities are transferred appropriately.

The final work associated with Close Procurements has now been included as part of the closing process.

Knowledge Area Information

The information that was previously included at the beginning of each Knowledge Area has been organized into four topics:

Key Concepts

The second contains information that was previously included at the beginning of each Knowledge Area

Trends and Emerging Practices

In the past, the *PMBOK® Guide* included what was considered good practice on most projects, most of the time. Many of the recent trends in the industry were not included as they were not practiced on many projects. Some of this new information is included in the 6th Edition in this introductory portion of each Knowledge Area, though it may not yet be reflected in the identified inputs, tools, techniques and outputs for individual processes.

Tailoring Considerations

As stated in previous editions, each project must determine which processes, and what approach is most appropriate for individual project. The Sixth Edition emphasizes the need to tailor all aspects of project management, including the processes, inputs, tools, techniques, outputs, life cycles and all others, as deemed necessary. In order to facilitate this tailoring, this section contains a list of questions to help with the tailoring of the project management aspects for each individual project.

Approaches in Agile, Iterative, and Adaptive Environments

The use of various aspects of agile, iterative and adaptive approaches for projects is increasing. This includes development methods, techniques, outputs and other activities and practices. Some agile terminology and techniques have been integration into specific *PMBOK® Guide* processes. The section describes specific approaches that are associated with various agile environments to help practitioners recognize and integrate these practices into their projects where it makes sense to do so.

Process Categories

Each process has been categorized by one of three descriptions:

- Processes used once or at predefined points in the project
- Processes that are done periodically as needed
- Processes that are done continuously throughout the project

These definitions were added to clear the misconception that the processes included are done in a linear manner, or that they are done only once, or done in a particular sequence. Since this is not true, it is hoped that this misconception can be corrected by emphasizing that many processes are ongoing, or only done periodically. This is further explained in Section 1.2.4.4 of the *PMBOK® Guide*.

Project Management Plan Components

Rather than listing individual components parts of the project management plan as an input or output of a process, the entire project management plan is listed. The process in which an individual component of the project management is developed lists that component as an output. In other processes that previously would have identified that component as an input, it is just referred to as part of the overall project management plan. The individual components that would be helpful as inputs or updated as outputs are contained in the textual description. However, it is important to remember that the description of project management plan components provides examples, but it is not meant to be all-inclusive or exhaustive.

Project documents

A similar approach has been applied to project documents. The process which actually creates a project document lists that document as an output. Rather than listing each project document separately in subsequent processes, the inclusive name, project documents, is identified as an input or an output. Some of these project documents are different from previous editions, once again emphasizing the need to tailor the project documents to reflect the needs of each individual project. Once again, the list of examples of project documents is not meant to be all-inclusive or exhaustive.

Lessons Learned

Project management as a profession has matured as to how knowledge and information is shared. This is reflected in the Sixth Edition with the inclusion of a new process, Manage Project Knowledge. One of the outputs from this new process is a lessons learned register, a project document that will be used as an input to many processes and updated as an output in many Executing and Monitoring and Controlling Processes Groups. At the end of a project or phase the information is transferred and becomes an Organization Process Asset referred to as a lessons learned repository.

Tools and Techniques

To support the importance of project tailoring, many tools and techniques are grouped together based on their purpose. The groups include:

- Data gathering
- Data analysis
- Decision making
- Communication
- Interpersonal and team skills
- Communication skills

When one of these groups is identified, one or more examples of specific tools or techniques may be given. As with the other inputs and outputs, the usage of these tools and techniques should be based on the needs of your project. This list is not all-inclusive or exhaustive and not all tools and techniques fall into one of these categories.

The table on the following page represents the updated version of the project framework with the *PMBOK® Guide* 6th edition changes identified:

Knowledge Areas (49 processes)	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Integration Management	.1 Develop Project Charter	.2 Develop Project Management Plan	.3 Direct and Manage Project Work .4 Manage Project Knowledge	.5 Monitor and Control Project Work .6 Perform Integrated Change Control	.7 Close Project or Phase
Project Scope Management		.1 Plan Scope Management .2 Collect Requirements .3 Define Scope .4 Create WBS		.5 Validate Scope .6 Control Scope	
Project Schedule Management		.1 Plan Schedule Management .2 Define Activities .3 Sequence Activities .4 Estimate Activity Durations .5 Develop Schedule		.6 Control Schedule	
Project Cost Management		.1 Plan Cost Management .2 Estimate Costs .3 Determine Budget		.4 Control Costs	
Project Quality Management		.1 Plan Quality Management	.2 Manage Quality	.3 Control Quality	
Project Resource Management		.1 Plan Resource Management .2 Estimate Activity Resources	.3 Acquire Resources .4 Develop Team .5 Manage Team	.6 Control Resources	
Project Communications Management		.1 Plan Communications Management	.2 Manage Communications	.3 Monitor Communications	
Project Risk Management		.1 Plan Risk Management .2 Identify Risks .3 Perform Qualitative Risk Analysis .4 Perform Quantitative Risk Analysis .5 Plan Risk Responses	.6 Implement Risk Responses	.7 Monitor Risks	
Project Procurement Management		.1 Plan Procurement Management	.2 Conduct Procurements	.3 Control Procurements	
Project Stakeholder Management	.1 Identify Stakeholders	.2 Plan Stakeholder Engagement	.3 Manage Stakeholder Engagement	.4 Monitor Stakeholder Engagement	

PMBOK® Guide 5th Edition Project Framework

For reference, following is the project framework outlined in the *PMBOK® Guide 5th edition*

Knowledge Areas (47 Processes)	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Integration Management	.1 Develop Project Charter	.2 Develop Project Management Plan	.3 Direct and Manage Project Work	.4 Monitor & Control Project Work .5 Perform Integrated Change Control	.6 Close Project or Phase
Project Scope Management		.1 Plan Scope Management .2 Collect Requirements .3 Define Scope .4 Create WBS		.5 Validate Scope .6 Control Scope	
Project Time Management		.1 Plan Schedule Management .2 Define Activities .3 Sequence Activities .4 Estimate Activity Resources .5 Estimate Activity Durations .6 Develop Schedule		.7 Control Schedule	
Project Cost Management		.1 Plan Cost Management .2 Estimate Costs .3 Determine Budget		.4 Control Costs	
Project Quality Management		.1 Plan Quality Management	.2 Perform Quality Assurance	.3 Control Quality	
Project Human Resource Management		.1 Plan Human Resource Management	.2 Acquire Project Team .3 Develop Project Team .4 Manage Project Team		
Project Communication Management		.1 Plan Communications Management	.2 Manage Communications	.3 Control Communications	
Project Risk Management		.1 Plan Risk Management .2 Identify Risks .3 Perform Qualitative Risk Analysis .4 Perform Quantitative Risk Analysis .5 Plan Risk Responses		.6 Control Risks	
Project Procurement Management		.1 Plan Procurement Management	.2 Conduct Procurements	.3 Control Procurements	.4 Close Procurements
Project Stakeholder Management	.1 Identify Stakeholders	.2 Plan Stakeholder Management	.3 Manage Stakeholder Engagement	.4 Control Stakeholder Engagement	

Detailed Analysis

CHAPTER 1

A foundational reference for PMI’s project management professional development programs and the practice of project management.

Details about key concepts, emerging trends, considerations for tailoring the project management processes, and information on tools and techniques are applied to projects. Incorporate terminology that reflect the spectrum of project management practices.

To instill confidence in the project management profession and to help an individual in making wise decisions.

The values that the global project management community defines as most important and that are the basis of the code are [responsibility](#), [respect](#), [fairness](#), and [honesty](#).

Introduction	PMBOK 5th Edition	PMBOK 6th Edition
Overview and Purpose of this Guide	Overview, Purpose of this Guide	Purpose of the <i>PMBOK® Guide</i>
	.1 Introduction	.1 Introduction
	.2 Purpose of the <i>PMBOK® Guide</i>	.2 Overview and Purpose of this Guide
	.3 What is a Project?	.3 The Standard for Project Management
	.4 The Relationships Among Portfolios, Programs, and Projects	.4 Common Vocabulary
		.5 Code of Ethics and Professional Conduct
Projects	What is a Project?	Foundational Elements
	.1 What is Project Management?	.1 Foundational Elements
	.2 Relationships Among Portfolio Management, Program Management, Project Management, and Organizational Project Management	.2 Relationship of Project, Program, Portfolio, and Operations Management
	.3 Relationship Between Project Management, Operations Management, and Organizational Strategy	
	.4 Business Value	
Projects	Project Manager	Key Components
	.1 Role of the Project Manager	.1 Components of the Guide

Introduction

1.1 Overview and Purpose of the PMBOK® Guide

The *PMBOK® Guide* is constantly evolving but identifies a subset of project management that is generally recognized as good practice. This *PMBOK® Guide* is different from a methodology but rather a foundation upon which organizations can build methodologies, policies, procedures, rules, tools and techniques, and life cycle phases needed to perform project management

1.1.1 The Standard for Project Management

The Standard for Project Management, upon which the *PMBOK® Guide* is based, is a foundational reference for PMI's project management professional development programs and the practice of project management, identifying processes that are considered good practices on most projects most of the time. Two other standards that PMI publishes include:

- The Standard for Portfolio Management, and
- The Standard for Program Management

1.1.2 Common Vocabulary

A common vocabulary is essential for a professional discipline. The PMI Lexicon of Project Management Terms provides the consistent vocabulary to be consistently used by portfolio, program and project managers along with their stakeholders.

1.1.3 Code of Ethics and Professional Conduct

PMI® publishes the Code of Ethics and Professional Conduct to instill confidence in the project management profession and to help individuals make wise decisions. Practitioners who do not conduct themselves in accordance with these standards are subject to disciplinary procedures before PMI's Ethics Review Committee.

1.2 Foundational Elements

Foundational elements necessary for working in and understanding the discipline of project management.

1.2.1 Projects

A project is a temporary endeavor undertaken to create a unique product, service, or result.

Projects drive change in organizations to achieve an increase in business value. Projects enable business value, which is defined as the net quantifiable benefit derived from a business endeavor. Leaders in organizations initiate projects in response to factors which influence their organization's ongoing

operations and business strategies, and which also align with the strategic objectives of the organization, including:

- Meet regulatory, legal or social requirements
- Satisfy stakeholder requests or needs
- Implement or change business or technological strategies; and
- Create, improve, or fix products, processes, or services

1.2.2 The Importance of Project Management

Project management enables organizations to execute projects effectively and efficiently. Effective and efficient project management should be considered a strategic competency within organizations,

1.2.3 Relationship of Project, Program, Portfolio, and Operations Management

1.2.3.1 Overview

Project management puts in place a sound foundation for organizations to achieve their goals and objectives. This may be managed through a stand-alone project, within a program, or within a portfolio

1.2.3.2 Program Management

Program management focuses on the interdependencies between component projects and the optimal approach for managing them

1.2.3.3 Portfolio Management

Portfolio management focuses on ensuring that projects and programs are reviewed to prioritize resource allocation and also confirm that the portfolio is consistent with and aligned with organizational strategies

1.2.3.4 Operations and Project Management

Ongoing operations are outside the scope of a project, but deliverables and knowledge are transferred between the project and operations for implementation of the delivered work at the end of the project, or through a transfer of operational resources to the project at the start.

1.2.3.5 Operations Management

Operations management is concerned with the ongoing production of goods and/or services – and is outside the scope of formal project management as described in the *PMBOK® Guide*

1.2.3.6 Organizational Project Management (OPM) and Strategies

Systematic management of portfolios, programs and projects through the application of organizational project management (OPM) allows for the achievement of an organization's strategic

business goals. OPM ensures that the organization undertakes the right projects, allocates critical resources appropriately, and all levels in the organizations understand the strategic vision, the initiatives that support the vision, the objectives and the deliverables.

1.2.4 Components of the guide

This guide identifies and explains some of the key components that, when effectively managed, result in successful completion of a project.

1.2.4.1 Project and Development Life Cycles

A project life cycle is a series of phases that a project passes through from its start to its completion. Project life cycles can be predictive or adaptive. Project life cycles are independent of a product life cycle. Within a project life cycle, one or more phases that are associated with the development of the product, service, or result and are referred to as development life cycles. Development life cycles can utilize various models including:

- Predictive
- Iterative
- Incremental
- Hybrid

1.2.4.2 Project Phase

A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables. These phases may be described by a variety of attributes and may be given names that indicate the type of work done in that phase. A key component used with project phases is the phase review.

1.2.4.3 Phase Review

A phase review is held at the end of a phase to compare the project's performance and progress to project and business documents. Often a go/no-go decision on whether to continue is made as a result of this review.

1.2.4.4 Project Management Processes

The project life cycle is managed by executing a series of activities known as project management processes. Processes are logically linked by the outputs they produce and may contain overlapping activities that occur throughout the project. Processes generally fall into one or three categories:

- Processes used once or at predefined points in the project
- Processes that are done periodically as needed
- Processes that are done continuously throughout the project

These processes are grouped in the *PMBOK® Guide* into five categories named Process Groups.

1.2.4.5 Project Management Process Groups

Project Management Process Groups are logical grouping of project management processes to achieve specific project objectives and are independent of Knowledge Areas and project phases.

1.2.4.6 Project Management Knowledge Areas

A Knowledge Areas is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools and techniques

1.2.4.7 Project Management Data and Information

A project collects, analyses, transforms and distributes lots of data and information, in various formats, to project team members and other stakeholders. Project data is collected as a result of various processes. It is collected and analyzed in context, aggregated and transformed into information and communicated verbally, stored, or distributed in various formats as reports. The key terminology includes:

- Work performance data
- Work performance information
- Work performance reports

1.2.5 Tailoring

1.2.5.1 Project Management Tailoring

Tailoring includes the selection of the appropriate project management processes, inputs, tools, techniques, outputs and life cycle phases by the project management to manage every unique project.

1.2.5.2 Project Management Methodology Tailoring

A methodology is a system of practices, techniques, procedures and rules used by those in a discipline, such as project management. There is no single project management methodology that can be applied to all projects all the time to produce a successful project every time, so therefore some tailoring is necessary, and is recognized as good practice

1.2.6 Project Management Business Documents

The project management approach must reflect the intent specified in business documents. These two key documents are interdependent and iteratively developed and maintained throughout the project life cycle. In many cases these documents are developed prior to starting the project, and are often used as input to justify the selection of the project by the Portfolio Management processes. The project sponsor is generally accountable for the development and maintenance of the project business case document.

1.2.6.1 Project Business Case

The project business case documents the economic feasibility that was used to establish the validity of the project benefits and used for authorization of project management activities. A needs assessment often precedes the business case and is often led by a business analyst. It is used to compare the progress and results of the project at various points in the life cycle with objectives and identified success criteria.

1.2.6.2 Project Benefits Management Plan

The project benefits management plan describes how and when the benefits of the project will be delivered, and describes how those benefits will be measured. These may include:

- Target benefits
- Strategic alignment
- Timeframe for realizing benefits
- Benefits owner
- Metrics
- Risks

This document complements the business case, project charter and project management plan and should be kept in alignment throughout the life cycle of the project by the project manager with the sponsor.

1.2.6.3 Project Charter and Project Management Plan

The project charter is issued by the project initiator or sponsor and formally authorizes the existence of a project and provides the project management to apply organizational resources to project activities

The project management plan describes how the project will be executed, monitored and controlled and defines the basis of all project work

1.2.6.4 Project Success Measures

Traditionally project success was measured by metrics of time, cost, scope and quality. More recently, it has been determined that project success should be measured with consideration toward achievement of project objectives. It may also include additional criteria linked to the organizational strategy and the delivery of business results.

CHAPTER 2

Projects exist and operate in environments that may have an influence on them. These influences can have a favorable or unfavorable impact on the project. The two major categories of influences are enterprise environmental factors and organizational process assets.

Introduction	<i>PMBOK® Guide 5th Edition</i>	<i>PMBOK® Guide 6th Edition</i>
The Environment	Organizational Influences and Project Life Cycle	The Environment in which Projects Operate
	.1 Project Stakeholders and Governance	.1 Enterprise environmental factors
	.2 Project Team	.2 Organizational process assets
	.3 Project Life Cycle	.3 Organizational Structure Types

2.1 Overview

Projects exist and operate in environments that may have an influence on them. These influences can have a favorable or unfavorable impact on the project. The two major categories of influences are enterprise environmental factors (EEFs) and organizational process assets (OPAs).

Organizational systems, with factors that impact the power, influence, interests, competencies and political capabilities of the people to act within those systems, also play a significant role in the life cycle of the project.

2.2 Enterprise Environmental Factors

Enterprise environmental factors may enhance or constrain project management options and may have a positive or negative influence on the outcome of the project.

2.2.1 EEFs Internal to the Organization

EEFs that are internal to the organization include:

- Organizational culture, structure, and governance
- Geographic distribution of facilities and resources
- Infrastructure
- Information technology software
- Human resources management policies and procedures

2.2.2 External to the Organization

EEF's that are external to the organization include:

- Marketplace conditions
- Social and cultural influences and issues

- Stakeholder expectations and risk appetites
- Legal restrictions
- Commercial databases
- Academic research
- Government or industry standards
- Financial considerations
- Physical environmental elements

2.3 Organizational Process Assets

These include any artefact, practice or knowledge from any or all of the organizations involved in the project that can be used to perform or govern the project. Since these are internal to the organization, the project team may update or add to the organizational process assets as necessary throughout the project. They may be grouped into two categories:

- Processes, policies, and procedures – which are not updated as part of the project work
- Corporate knowledge bases – which are updated throughout the project with project information

2.3.1 Processes, Policies and Procedures

The processes and procedures that apply to how project work is conducted can be grouped based on the process groups.

Initiating and Planning:

- Guidelines and criteria for tailoring standard processes
- Specific organizations policies
- Product and project life cycles, and methods and procedures
- Templates

Executing, Monitoring and Controlling

- Change control procedures
- Lessons learned repositories
- Requirements management repositories; traceability tools
- Financial controls procedures
- Issues and defect management procedures
- Resource availability control and assignment management
- Organizational communication requirements
- Procedures for prioritizing, approving and issuing work authorizations
- Risk management templates
- Standardized guidelines, work instructions, proposal evaluation criteria, and performance measurement criteria
- Product verifications

Closing

- Project closure guidelines or requirements

2.3.2 Corporate Knowledge Repositories

These repositories for storing and retrieving information include:

- Configuration management knowledge repositories
- Financial data repositories
- Historical information and lessons learned knowledge repositories
- Issue and defect management data repositories
- Data repositories for metrics used on processes and product
- Project files from previous projects

2.4 Organizational Systems

2.4.1 Overview

For projects operate effectively and efficiently within the constraints imposed by the organization through their structure and governance framework, it is necessary for the project manager to understand where responsibility, accountability and authority reside within the organization. The organizational system determines the power, influence, interests, competence and political capabilities of the people who can act within the system. The complete information regarding these factors and how they impact a project is not part of this guide

Systems, in general, are a collect of various components that together can produce results not obtainable by the individual components alone. A component is often an organization that provides a function or group of related functions, and is the responsibility of the organization's management. Several principles regarding systems include:

- Systems are dynamic
- Systems can be optimized
- System components can be optimized
- Systems and components cannot be optimized at the same time
- Systems are nonlinear in responsiveness (a change in the input does not produce a predictable change in the output_

2.4.2 Organizational Governance Frameworks

Governance refers to organizational or structure arrangements at all levels of an organization designed to determine and influence the behavior or organization members. This considers people, roles, structures and policies and requires direction and oversight through data and feedback.

Project governance framework comprises four governance domains:

- Alignment
- Risk
- Performance
- Communication

Each function has associated process and activities for both stand-alone projects or projects within portfolio or program environments (as described in Governance of Portfolios, Programs, and Projects: A Practice Guide)

2.4.3 Management Elements

Management elements are the components that comprise the key functions or general management principles of the organization. Management elements include:

- Division of work using specialized skills and availability to perform work
- Authority given to perform work
- Responsibility to perform work appropriately assigned based on such attributes as skill and experience
- Discipline of action
- Unity of command
- Unity of direction
- General goals of the organization take precedence over individual goals
- Paid fairly for work performed
- Optimal use of resources
- Clear communication channels
- Right materials to the right person for the right job at the right time
- Fair and equal treatment of people in the workplace
- Clear security of work positions
- Open contribution to planning and execution by each person
- Morale

2.4.4 Organizational Structure Types

There is not a one-size-fits-all organizational structure.

2.4.4.1 Organizational Structure Types

Organizational structures take many forms or types and each influences a project differently, especially as regards the authority of the project manager. Organizational structure types can include:

- Organic or Simple (flexible)
- Functional (centralized)
- Multidivisional with replication for each division with little centralization
- Matrix – strong
- Matrix – weak
- Matrix – balanced
- Project-oriented (composite, hybrid)
- Virtual
- Hybrid
- PMO (Portfolio, program, or project management office or organization)

2.4.4.2 Factors in Organization Structure Selection

Factors to consider in selecting an organization structure include:

- Degree of alignment with organizational objectives
- Specialization capabilities
- Span of control efficiency and effectiveness
- Clear path for escalation of decisions

- Clear line and scope of authority
- Delegation capabilities
- Accountability assignment
- Responsibility assignment
- Adaptability of design
- Simplicity of design
- Efficiency of performance
- Cost considerations
- Physical locations
- Clear communication

2.4.4.3 Project Management Office

The project management office (PMO) is a management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools and techniques. The primary function of a PMO is to support project managers. The various types of PMOs vary in the degree of control and influence on projects within the organization, such as:

- Supportive
- Controlling
- Directive

CHAPTER 3

The Project Manager plays a critical role in the leadership of a project team to achieve the project's objectives.

Introduction	<i>PMBOK® Guide 5th Edition</i>	<i>PMBOK® Guide 6th Edition</i>
Project Manager	Project Management Process Interactions	The Role of the Project Manager
	.1 Project Information	.1 Overview
	.2 Role of the Knowledge Areas	.2 Definition of a Project Manager
		.3 The Project Manager's Sphere of Influence
		.4 Project Manager Competencies
		.5 Comparison of Leadership and Management
		.6 Performing Integration

3. The Role of the Project Manager

3.1 Overview

The role of a project manager may vary from organization to organization and is often tailored to fit the business. Project managers become involved in a project from its initiation to its closing, and, in some organizations, may also be involved in the evaluation and analysis activities prior to project initiation. The project manager may also manage or assist in business analysis, business case development, and aspects of portfolio management as well as being involved in follow-on activities related to realizing business benefits from the project. The role includes:

- Membership and roles
- Responsibility for team
- Knowledge and skills

3.2 Definition of a Project Manager

The project manager is assigned by the performing organization to lead the team that is responsible for achieving the project objectives. Operations managers are responsible for ensuring that business operations are efficient

3.3 The Project Manager's Sphere of Influence

3.3.1 Overview

Project managers fulfil numerous roles within their sphere of influence. These roles reflect the capabilities of the project manager and represent the value and contributions of the project management profession.

3.3.2 The Project

The project manager leads the project team to meet the project's objectives and satisfy the project stakeholders, while balancing the various constraints with the resources available. Also included is communicating with the project sponsor, team members, and stakeholders. Soft skills are used to balance conflicting and competing goals to achieve consensus. Project managers are able to distinguish themselves by having superior relationship and communication skills.

3.3.3 The Organization

Project managers proactively interact with other project managers who manage other independent projects or projects that are part of the same program. These interactions may impact because of

- Demands on the same resources
- Priorities of funding
- Receipt or distribution of deliverables
- Alignment of project goals and objectives with those of the organization

Project managers also works with managers within the organization during the project, including the project sponsor to address internal political and strategic issues that may impact the team or quality of the project.

The project manager works toward increasing the project management competency and capability within the organization and is involved in both tacit and explicit knowledge transfer or integration initiatives.

Depending on the organizational structure the project may report to various organizational managers, but also must work closely and in collaboration with other roles in the organization.

3.3.4 The Industry

The project manager must stay informed about current industry trends and how they might impact or apply to current projects. These include:

- Product development
- New and changing market niches
- Standards
- Technical support tools
- Economic forces that impact the immediate project
- Influences affect the project management discipline
- Sustainability strategies

3.3.5 Professional Discipline

Knowledge and development is ongoing in the project management profession and continuing knowledge transfer and integration is very important. This knowledge transfer and integration includes;

- Contribution of knowledge and expertise to others within the profession
- Participation in continuing education and development in the profession itself, in a related profession or in other professions

3.3.6 Across Disciplines

A professional project manager may choose to orient and educate other professional regarding the value of a project management approach to the enterprise by serving as information ambassador, educating the enterprise on the advantages of project management including timeliness, quality, innovation and resource management.

3.4 Project Manager Competencies

3.4.1 Overview

The PMI talent triangle focuses on the three key skill sets needed by project managers including

- Technical project management
- Leadership
- Strategic and business management

Even though technical skills are core to project management, companies are seeking added skills in leadership and ability to support longer-range strategic objectives that contribute to the bottom line.

3.4.1.1 Levels of Skills Capability

There are several levels of competence that may be possessed regarding specific skills. A personal inventory of skills and the level of competence for each one must be maintained. The five major levels of skills capability include:

- Unconsciously incompetent
- Consciously incompetent
- Consciously competent
- Unconsciously competent
- Chosen conscious competency

3.4.1.2 Skill Development

To become skilled in a particular method, tool or technique requires that an individual take a series of steps to progress from the acquisition of data through the skilled development process, and finally, to the application of skills. These steps include:

- Data
- Information
- Knowledge
- Understanding (Analysis and Synthesis)
- Wisdom (Experience)
- Application

3.4.2 Technical Project Management Skills

Technical project management skills are the skills to effectively apply project management knowledge to deliver the desired outcomes for programs or projects. Several key skills that top project managers consistently demonstrate include:

- Focus on critical project management elements, including having the right artifacts readily available
- Tailor both traditional and agile tools, techniques, and methods for each project
- Managing project elements, including schedule, cost, resources and risk

3.4.3 Strategic and Business Management Skills

Strategic and business management skills involve the ability to see the high-level overview of the organization and effectively negotiate and implement decisions and actions that support strategic alignment and innovation. These skills help the project manager determine which business factors should be considered for the project and how they could affect the project. These factors include:

- Risks and issues
- Financial implications
- Cost versus benefit analysis
- Business value
- Benefits realization expectations and strategies
- Scope, budget, schedule, and quality

Through the application of business knowledge, a project manager has the ability to make the appropriate decisions and recommendations for a project. As conditions change, the project manager and sponsor must work to keep the business and project strategies aligned.

3.4.4 Leadership Skills

Leadership skills involve the ability to guide, motivate, and direct a team. These skills may include essential capabilities such as negotiation, resilience, communication, problem solving, critical thinking and interpersonal skills.

3.4.4.1 Dealing with People

A large part of the project manager's role involves dealing with people and the project manager should strive to be a good leader. Leadership skills and qualities are applied to work with all project stakeholders, including the project team, the steering committee team and project sponsor.

3.4.4.2 Qualities and Skills of a Leader

Qualities and skills of a leader includes

- Being a visionary
- Being optimistic and positive
- Being collaborative
- Managing relationships and conflict
- Communication
- Retaining sound personal perceptions and beliefs that he or she adds value to the work

- Being respectful, courteous, friendly, kind, honest, trustworthy, loyal, and ethical
- Exhibiting integrity and being culturally sensitive, courageous, a problem solver, and decisive
- Being a life-long learner who is results- and action-oriented
- Focusing on the important things
- Having a holistic and systemic view of the project
- Being able to apply critical thinking
- Being able to build effective teams, be service-oriented, and have fun and share humor effectively with team members

3.4.4.3 Politics, Power, and getting Things Done

Leadership and management are ultimately about being able to get things done and achieve the project goals and objectives they embrace. The root of many skills and qualities is the ability to deal with politics. The manager must select the right kind of power to influence and negotiate with others. There are numerous forms of power including:

- Positional
- Informational
- Referent
- Situational
- Personal or charismatic
- Relational
- Expert

3.4.5 Comparison of Leadership and Management

“Managing” is closely associated with directing another person to get from one point to another using a known set of expected behaviors. In contrast, “leadership” involves working with others through discussion or debate in order to guide them from one point to another. Project managers need to employ both leadership and management in order to be successful but the right balance for each situation

3.4.5.1 Leadership Styles

The leadership style a project manager select may be a personal preference, or the result of the combination of multiple factors associated with the project, and may change over time based on factors including:

- Leader characteristics
- Team member characteristics
- Organizational characteristics
- Environmental characteristics
- Laissez-faire
- Transactional
- Servant leader
- Transformational
- Charismatic
- Interactional

3.4.5.2 Personality

Personality refers to the individual differences in characteristic patterns of thinking, feeling, and behaving. Each project, organization and situation requires that the project manager emphasize different aspects of personality including:

- Authentic
- Courteous
- Creative
- Cultural
- Emotional
- Intellectual
- Managerial
- Political
- Service-oriented
- Social
- Systemic

3.5 Performing Integration

The role of the project manager is twofold when performing integration on the project

- Working with the project sponsor to understand the strategic objectives and ensure the alignment of the project objects and results with those of the portfolio, program and business areas and therefore contribute to the execution of the integration of the strategy
- Responsible for convincing everyone on the team to work in the same direction and focus on what is essential at the project level

3.5.1 Performing Integration at the Process Level

Project management includes a set of processes and activities that are done to achieve project objectives. It is critical that the project manager understands how to integrate the various project processes and where they interact.

3.5.2 Integration at the Cognitive Level

The project manager should be proficient in all the Knowledge areas and is able to apply experience, insight, leadership and technical and business management skills to the project. It is through the ability of the project manager that the integration of the processes in the various Knowledge Areas makes it possible to achieve the desired project results.

3.5.3 Integration at the Context Level

Project managers must be cognizant of the new context in which business and projects exist today and be able to decide how best to use these new elements to achieve success

3.5.4 Integration and Complexity

Complexity in a project is the result of the organization's system behavior, human behavior and the uncertainty within the organization or its environment. The three dimensions of complexity are:

- System behavior
- Human behavior
- Ambiguity

A project is more accurately described as containing elements of complexity include:

- Containing multiple parts
- Possessing a number of connections between the parts
- Exhibiting dynamic interactions between the parts

Exhibiting behavior produced because of those interactions that cannot be explained as the simple sum of the parts (emergent behavior)

SUMMARY OF MAJOR CHANGES: CHAPTERS 4 – 13

Additional Sections

In addition to the information for each Knowledge Area and processes present in the 5th Edition of the PMBOK, a few new sections have been added. These include:

- Project management trends and emerging practices that cover what is considered a good practice on most projects. These are new project management trends that are described in this section and may not be reflected in the process inputs, tools, techniques and outputs.
- Tailoring considerations emphasizing the necessity of modify the processes, inputs, tools and techniques, outputs, life cycles and all other aspects of project management. This section also contains a list of questions to help project managers tailor their approach to their project.
- Approaches in agile, iterative and adaptive environments have been increasing in many more projects. Some agile techniques have been integrated into this version of the PMBOK Guide. This section describes specific approaches that are aligned with agile environments to help project managers identify and integrate these practices into their projects where it makes sense to do so.

Input and Output Changes

In many of the processes, the inputs from the 5th edition, which included the subsidiary project management plans or specific project documents, have now been combined into the overall Project Management Plan or Project Documents. The specific items that are applicable, but not limited to, and previously referred to, have been noted in the changes to the specific items for each process below.

Project Management Plan Components

Another change from previous editions is that the Sixth Edition mentions the project management plan as an input or output of a process, rather than listing individual component parts of the project management plan. The process by which a project management plan component is developed lists that component as an output. In other processes, it is listed as a project management plan component. In the text, there is a description of some of the common components that can be helpful as inputs or updated as outputs; however, please keep in mind that the list provides examples only, it is not meant to be all-inclusive or exhaustive.

Project Documents

A similar approach has been applied to project documents. The process in which a project document is created lists the document as an output. Thereafter, rather than listing each project document separately, the inclusive heading of project documents has been identified as an input or an output.

Some of the project documents are different from those in previous editions. This underscores the need to tailor the appropriate project documents based on the needs of a specific project. Again, the list of examples is not meant to be all-inclusive or exhaustive.

CHAPTER 4: Project Integration Management

4.1 Develop Project Charter

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Initiating	4.1 Develop Project Charter	4.1 Develop Project Charter
Inputs	<ul style="list-style-type: none"> .1 Project statement of work .2 Business case .3 Agreements .4 Enterprise environmental factors .5 Organizational process assets 	<ul style="list-style-type: none"> .1 Business Documents .2 Agreements .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Expert judgment .2 Facilitation techniques 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Interpersonal and team skills
Outputs	<ul style="list-style-type: none"> .1 Project charter 	<ul style="list-style-type: none"> .1 Project charter .2 Assumption log

New Inputs:

Business Documents: These documents include, but are not limited to:

- a. Business Case – describes the necessary information to determine whether the expected outcomes of the project justify the required investment
- b. Projects Benefits Management Plan – includes information on the strategic alignment of the project with the business objectives of the organization and the target benefits to be obtained

Clarification: Even though Agreements are not new to this edition, it is important to remember that they represent a general grouping of project documents that define initial intentions for the project.

New Tools:

Data Gathering: This includes techniques, many of which were previously referred to as Facilitation Techniques, which can be used for this process, but are not limited to:

- a. Brainstorming,
- b. Focus Groups
- c. Interviews

Interpersonal and Team Skills: These skills that can be used for this process include, but are not limited to:

- a. Conflict Management
- b. Facilitation
- c. Meeting Management

New Outputs:

Assumption Log: This log records all assumptions and constraints throughout the project life cycle and is often included as part of Project Documents.

4.2 Develop Project Management Plan

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	4.2 Develop Project Management Plan	4.2 Develop Project Management Plan
Inputs	<ul style="list-style-type: none"> .1 Project charter .2 Outputs from other processes .3 Enterprise environmental factors .4 Organizational process assets 	<ul style="list-style-type: none"> .1 Project charter .2 Outputs from other processes .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Expert judgment .2 Facilitation techniques 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Interpersonal and team skills .4 Meetings
Outputs	<ul style="list-style-type: none"> .1 Project management plan 	<ul style="list-style-type: none"> .1 Project management plan

New Inputs: None

New Tools:

Data Gathering: This includes activities, many of which were previously referred to as Facilitation Techniques, which can be used for this process, but are not limited to:

- a. Brainstorming
- b. Checklists
- c. Focus Groups
- d. Interviews

Interpersonal and Team Skills: These skills include, but are not limited to:

- a. Conflict Management
- b. Facilitation
- c. Meeting Management

Meetings: These are used for, but are not limited to:

- a. Discuss the project approach
- b. Determine how work will be executed to accomplish the project objectives
- c. Establish the way the project will be monitored and controlled.

The project kick-off meeting is very specific to this process to communicate the objectives of the project, gain commitment of the team for the project, and explain the roles and responsibilities of each stakeholder

New Outputs: None

4.3 Direct and Manage Project Work

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
	4.3 Direct and Manage Project Work	4.3 Direct and Manage Project Work
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Approved Change requests .3 Enterprise environmental factors .4 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Approved change requests .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Expert judgment .2 Project management information system .3 Meetings 	<ul style="list-style-type: none"> .1 Expert judgment .2 Project management information system .3 Meetings
Outputs	<ul style="list-style-type: none"> .1 Deliverables .2 Work performance data .3 Change requests .4 Project management plan updates 	<ul style="list-style-type: none"> .1 Deliverables .2 Work performance data .3 Issue log .4 Change requests

.5 Project documents updates

.5 Project management plan updates

.6 Project documents updates

.7 Organizational process assets updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Change log
- b. Lessons learned register
- c. Milestone list
- d. Project Communications
- e. Project Schedule
- f. Requirements traceability matrix
- g. Risk register
- h. Risk report

New Outputs:

Issue Log: This is a project document where all the issues are recorded and tracked and will be referenced as part of the Project Documents category in future processes.

Organizational Process Assets Updates: This is not necessarily a new output, but has been added to this process in order to make sure that the results of this process are included, where necessary.

4.4 Manage Project Knowledge

New Process:

Manage Project Knowledge: Process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing		4.4 Manage Project Knowledge
Inputs		.1 Project management plan .2 Project documents .3 Deliverables .4 Enterprise environmental factors

Tools & Techniques	.5 Organizational process assets
	.1 Expert judgment
	.2 Knowledge management
	.3 Information management
	.4 Interpersonal and team skills
Outputs	.1 Lessons learned register
	.2 Project management plan updates
	.3 Organizational process assets updates

New Inputs:

Project Management Plan: This includes all components of the project management plan

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register
- b. Project team assignments
- c. Resource breakdown structure
- d. Source selection criteria
- e. Stakeholder register

Deliverables: Any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project

Enterprise Environmental Factors: Factors that can influence this process include, but are not limited to:

- a. Organization, stakeholder, and customer culture
- b. Personnel administration
- c. Geographic distribution of facilities and resources
- d. Organizational knowledge experts
- e. Project Schedule
- f. Legal and regulatory requirements and/or constraints

Organizational Process Assets: The assets that can influence this process include, but are not limited to:

- a. Organizational standard policies, processes, and procedures
- b. Organizational communication requirements
- c. Formal knowledge- and information-sharing procedures

New Tools:

Expert Judgement: Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:

- a. Knowledge management
- b. Information management
- c. Organizational learning
- d. Knowledge and information management tools
- e. Relevant information from other projects

Knowledge Management: Tools and techniques which connect people, face-to-face or virtually, or both, so they can work together to create new knowledge, share tacit knowledge, and integrate the knowledge of diverse team members include, but are not limited to:

- a. Networking
- b. Communities of practice or interest, and special interest groups
- c. Meetings
- d. Work shadowing and reverse shadowing
- e. Discussion forums such as focus groups
- f. Knowledge-sharing events such as seminars and conferences
- g. Workshops, including problem-solving sessions and learning reviews to identify lessons learned
- h. Storytelling
- i. Creativity and ideas management techniques
- j. Knowledge fairs and cafes
- k. Training involving interaction between learners

Information Management: The tools and techniques used to create and connect people to information in order to share simple, unambiguous, codified explicit knowledge for this process include, but are not limited to:

- a. Methods for codifying explicit knowledge
- b. Lessons learned register
- c. Library services
- d. Information gathering
- e. Project management information system

Interpersonal and Team Skills: The skills used for this process include, but are not limited to:

- a. Active listening (described in 10.2.2.6), to reduce misunderstandings and improve communication and knowledge sharing
- b. Facilitation (described in 4.1.2.3), helps to effectively guide a group to a successful decision, solution, or conclusion
- c. Leadership (described in 3.4.4), used to communicate the vision and inspire the project team to focus on the appropriate knowledge and knowledge objectives
- d. Networking (described in 10.2.2.6), allows information connections and relations among project stakeholders to be established and creates the conditions to share tacit and explicit knowledge
- e. Political awareness (described in 10.1.2.6), helps the project manager to plan communications based on the project environment as well as the organization's political environment

New Outputs:

Lessons Learned Register: It can include the category and description of the situation. It may also include its impact, recommendations, and proposed actions. The lessons learned register records challenges, problems, and successes beginning early in the project and updated throughout the project

Project Management Plan Updates: Changes to the project management plan should go through the organization's change control process via a change request. Any component of the project management plan may be updated as a result of this process

Organizational Process Assets Updates: All projects create new knowledge and some of which is codified, embedded in deliverables, or embedded in improvements to processes and procedures as a result of this process and can update existing assets as a result of this process

4.5 Monitor and Control Project Work

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	4.4 Monitor and Control Project Work	4.5 Monitor and Control Project Work
Inputs	<ol style="list-style-type: none"> .1 Project management plan .2 Schedule forecasts .3 Cost forecasts .4 Validated changes .5 Work performance information .6 Enterprise environmental factors .7 Organizational process assets 	<ol style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance information .4 Agreements .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	<ol style="list-style-type: none"> .1 Expert judgment .2 Analytical techniques .3 Project management information system .4 Meetings 	<ol style="list-style-type: none"> .1 Expert judgment .2 Data analysis .3 Decision making .4 Meetings
Outputs	<ol style="list-style-type: none"> .1 Change requests .2 Work performance reports .3 Project management plan updates .4 Project documents updates 	<ol style="list-style-type: none"> .1 Work performance reports .2 Change requests .3 Project management plan updates .4 Project documents updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Basis of estimates (described in 6.4.3.2)
- c. Cost forecasts (described in 7.4.3.2)
- d. Issue log (described in 4.3.3.3)
- e. Lessons learned register (described in 4.4.3.1)
- f. Milestone list (described in 6.2.3.3)
- g. Quality reports (described in 8.2.3.1)
- h. Risk register (described in 11.2.3.1)
- i. Risk report (described in 11.2.3.2)
- j. Schedule forecasts (described in 6.6.3.2)

Agreements: Procurement agreements include terms and conditions, and may incorporate other items that the buyer specifies regarding what the seller is to perform or provide. The project manager needs to oversee any contracted work to make certain that all agreements meet the specific needs of the project while adhering to organization procurement policies

New Tools:

Data Analysis: Techniques that can be used for this process include, but are not limited to:

- a. Alternatives analysis (described in 9.2.2.5)
- b. Cost-benefit analysis (described in 8.1.2.3)
- c. Earned value analysis (described in 7.4.2.2)
- d. Root cause analysis (described in 8.2.2.2)
- e. Trend analysis
- f. Variance analysis

Decision Making: Technique that can be used for this process include, but are not limited to, voting. Voting can include making decisions based on

- a. Unanimity
- b. Majority
- c. Plurality
- d. Autocratic methods

4.6 Perform Integrated Change Control

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	4.5 Perform Integrated Change Control	4.6 Perform Integrated Change Control
Inputs	.1 Project management plan .2 Work performance reports .3 Change requests .4 Enterprise environmental factors .5 Organizational process assets	.1 Project management plan .2 Project documents .3 Work performance reports .4 Change requests .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	.1 Expert judgment .2 Meetings .3 Change control tools	.1 Expert judgment .2 Change control tools .3 Data analysis .4 Decision making .5 Meetings
Outputs	.1 Approved change requests .2 Change log .3 Project management plan updates .4 Project documents updates	.1 Approved change requests .2 Project management plan updates .3 Project documents updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Basis of estimates (described in 6.4.3.2)
- b. Requirements traceability matrix (described in 5.2.3.2)
- c. Risk report (described in 11.2.3.2)

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Alternatives analysis (described in 9.2.2.5)
- b. Cost-benefit analysis (described in 8.1.2.3)

Decision Makings: Techniques that can be used for this process include, but are not limited to:

- a. Voting (described in 5.2.2.4)
- b. Multicriteria decision making (described in 8.1.2.4), which uses a decision matrix to provide a systematic analytical approach to evaluate according to a set of predefined criteria

New Outputs: None

4.7 Close Project or Phase

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Closing	4.6 Close Project or Phase	4.7 Close Project or Phase
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Accepted deliverables .3 Organizational process assets 	<ul style="list-style-type: none"> .1 Project charter .2 Project management plan .3 Project documents .4 Accepted deliverables .5 Business documents .6 Agreements .7 Procurement documentation .8 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Expert judgment .2 Analytical techniques .3 Meetings 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data analysis .3 Meetings
Outputs	<ul style="list-style-type: none"> .1 Final product, service, or result transition .2 Organizational process assets updates 	<ul style="list-style-type: none"> .1 Final product, service, or result transition .2 Project documents updates .3 Final report .4 Organizational process assets updates

New Inputs:

Project Charter: This documents the project success criteria, the approval requirements, and who will sign off on the project

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumptions log (described in 4.1.3.2)
- b. Basis of estimates (described in 7.2.3.2)
- c. Change log (described in 4.6.3.3)
- d. Issue log (described in 4.5.3.3)
- e. Lessons learned register (described in 4.3.3.1)
- f. Milestone list (described in 6.2.3.3)
- g. Project communications (described in 10.2.3.1)
- h. Quality control measurements (described in 8.3.3.1)
- i. Quality reports (described in 8.2.3.1)
- j. Requirements documentation (described in 5.2.3.1)
- k. Risk register (described in 11.2.3.1)
- l. Risk report (described in 11.2.3.2)

Business Documents: The business documents for this process include, but are not limited to:

- a. Business case
- b. Benefits management plan

Agreements: These include the requirements for formal procurement closure and are usually defined in the terms and conditions of the contract and are included in the procurement management plan

Procurement Documentation: To close a contract, all procurement documentation is collected, indexed and filed. Contract information that should be considered includes, but are not limited to:

- a. Contract schedule, scope, quality and cost performance
- b. Contract change documentation
- c. Payment records
- d. Inspection results
- e. "As-built" plans/drawings or "as-developed" documents, manuals, troubleshooting and other technical documentation

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Document analysis (described in 5.2.2.3)
- b. Regression analysis
- c. Trend analysis (described in 4.5.2.2)
- d. Variance analysis (described in 4.5.2.2)

New Outputs:

Project Document Updates: The project documents that can be updated as a result of this process include, but are not limited to the lessons learned register. This final lessons learned register may include information on:

- a. Benefits management
 - b. Accuracy of the business case
 - c. Project and development life cycles
 - d. Risk and issue management
 - e. Stakeholder engagement
 - f. Other project management processes
-

CHAPTER 5: Project Scope Management

5.1 Plan Scope Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	5.1 Plan Scope Management	5.1 Plan Scope Management
Inputs	.1 Project management plan .2 Project charter .3 Enterprise environmental factors .4 Organizational process assets	.1 Project charter .2 Project management plan .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	.1 Expert judgment .2 Meetings	.1 Expert judgment .2 Data analysis .3 Meetings
Outputs	.1 Scope management plan .2 Requirements management plan	.1 Scope management plan .2 Requirements management plan

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New Inputs: None

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to alternatives analysis. Evaluation is done of various way of:

- a. Collecting and eliciting requirements
- b. Elaborating the project and product scope
- c. Creating the product
- d. Validating the scope
- e. Controlling the scope

New Outputs: None

5.2 Collect Requirements

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	5.2 Collect Requirements	5.2 Collect Requirements
Inputs	<ul style="list-style-type: none"> .1 Scope management plan .2 Requirements management plan .3 Stakeholder management plan .4 Project charter .5 Stakeholder register 	<ul style="list-style-type: none"> .1 Project charter .2 Project management plan .3 Project documents .4 Business documents .5 Agreements .6 Enterprise environmental factors .7 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Interviews .2 Focus groups .3 Facilitated workshops .4 Group creativity techniques .5 Group decision-making techniques .6 Questionnaires & surveys .7 Observations .8 Prototypes .9 Benchmarking .10 Context diagrams .11 Document analysis 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Data analysis .4 Decision making .5 Communication Data Representation .6 Interpersonal and team skills .7 Context diagram .8 Prototypes
Outputs	<ul style="list-style-type: none"> .1 Requirements documentation .2 Requirements traceability matrix 	<ul style="list-style-type: none"> .1 Requirements documentation .2 Requirements traceability matrix

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New Inputs:

Project Management Plan: The portions of this document specifically applicable to this process include, but are not limited to:

- a. Scope management plan (described in 5.1.3.1)
- b. Requirements management plan (described in 5.1.3.2)
- c. Stakeholder engagement plan (described in 13.2.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumptions log (described in 4.1.3.2)
- b. Lessons learned register (described in 4.3.3.1)
- c. Stakeholder register (described in 13.1.3.1)

Business Documents: The business documents for this process includes the business case, which can describe required, desired, and optional criteria for meeting the business needs

Agreements: Can contain project and product requirements

Enterprise Environment Factors: The factors that can influence this process include, but are not limited to:

- a. Organization's culture
- b. Infrastructure
- c. Personnel administration
- d. Marketplace conditions

Organizational Process Assets: The assets that can influence this process include, but are not limited to:

- a. Policies and procedures
- b. Historical information
- c. Lessons learned repository

New Tools:

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:

- a. Business analysis
- b. Requirements elicitation
- c. Requirements analysis
- d. Project requirements in previous similar projects
- e. Diagramming techniques
- f. Facilitation
- g. Conflict management

Data Gathering: This includes activities, previously referred to as Facilitation or Group Creativity Techniques, which can be used for this process, but are not limited to:

- a. Brainstorming (described in 4.1.2.2)
- b. Interviews
- c. Focus groups
- d. Questionnaires
- e. Benchmarking (described in 8.1.2.2)

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Mind mapping
- b. Document analysis – including techniques often utilized by business analysts, but not limited to:
 - Agreements
 - Business plans
 - Business process or interface documentation
 - Business rules repositories
 - Current process flows
 - Marketing literature
 - Problem/issue logs
 - Policies and procedures
 - Regulatory documentation such as laws, codes, or ordinances
 - Requests for proposal
 - Use cases

Decision Makings: Techniques that can be used for this process include, but are not limited to:

- a. Voting (described in 5.2.2.4)
- b. Multicriteria decision making (described in 8.1.2.4)

Communication: Techniques that can be used for this process include, but are not limited to affinity diagrams, which allow large numbers of ideas to be classified into groups for review and analysis

Data Representation:

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Interpersonal and Team Skills: The skilled used for this process include, but are not limited to:

- a. Nominal group
- b. Observation conversation, also known as “job shadowing”
- c. Facilitation (described in 4.1.2.3) skills used, but are not limited to
 - Joint application design/development (JAD)
 - Quality function deployment (QFD)
 - User stories

New Outputs: None

5.3 Define Scope

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	5.3 Define Scope	5.3 Define Scope
Inputs	.1 Scope management plan .2 Project charter .3 Requirements documentation .4 Organizational process assets	.1 Project charter .2 Project management plan .3 Project documents .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	.1 Expert judgment .2 Product analysis .3 Alternatives generation .4 Facilitated workshops	.1 Expert judgment .2 Data analysis Decision making .3 Decision making .4 Interpersonal and team skills .5 Product analysis
Outputs	.1 Project scope statement .2 Project documents updates	.1 Project scope statement .2 Project documents updates

New Inputs:

Project Management Plan: The component of this document that can be helpful in this process includes, but is not limited to:

- a. Scope management plan which documents how the project scope will be defined, validated and controlled.

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumptions log (described in 4.1.3.2)
- b. Requirements documentation (described in 5.2.3.1)

Enterprise Environmental Factors: Factors that can influence this process include, but are not limited to:

- a. Organization's culture
- b. Infrastructure
- c. Personnel administration
- d. Marketplace conditions

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to alternatives analysis. This can include:

- a. Determining which schedule methodology to use, or how to combine various methods
- b. Determining how detailed the schedule needs to be
- c. The duration of waves for rolling wave planning
- d. How often it should be reviewed and updated

Decision Makings: Techniques that can be used for this process include, but are not limited to:

- a. Alternatives analysis to evaluate ways to meet the requirements and objectives identified in the charter
- b. Multicriteria decision making (described in 8.1.2.4)

Interpersonal and Team Skills: The skill used for this process include, but is not limited to facilitation.

New Outputs: None

5.4 Create WBS

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	5.4 Create WBS	5.4 Create WBS
Inputs	<ul style="list-style-type: none"> .1 Scope management plan .2 Project scope statement .3 Requirements documentation .4 Enterprise environmental factors .5 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Decomposition .2 Expert judgment 	<ul style="list-style-type: none"> .1 Expert judgment .2 Decomposition
Outputs	<ul style="list-style-type: none"> .1 Scope baseline .2 Project documents updates 	<ul style="list-style-type: none"> .1 Scope baseline .2 Project documents updates

New Inputs:

Project Management Plan: The component of this document that can be helpful in this process includes, but is not limited to:

- a. Scope management plan which documents how the WBS will be created from the project scope statement and how the WBS will be maintained and approved

Project Documents: The project documents for this process include, but are not limited to:

- a. Project scope statement (described in 5.3.3.1)
- b. Requirements documentation (described in 5.2.3.1)

New Tools: None

New Outputs: None

5.5 Validate Scope

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	5.5 Validate Scope	5.5 Validate Scope
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Requirements documentation .3 Requirements traceability matrix .4 Verified deliverables .5 Work performance data 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Verified Deliverables .4 Work performance data
Tools & Techniques	<ul style="list-style-type: none"> .1 Inspection .2 Group decision making techniques 	<ul style="list-style-type: none"> .1 Inspection .2 Decision making
Outputs	<ul style="list-style-type: none"> .1 Accepted deliverables .2 Change requests .3 Work performance information .4 Project documents updates 	<ul style="list-style-type: none"> .1 Accepted deliverables .2 Work performance information .3 Change requests .4 Project documents updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Quality reports (described in 8.2.3.1)
- b. Lessons learned register (described in 4.4.3.1)
- c. Requirements documentation (described in 5.2.3.1)
- d. Requirements traceability matrix (described in 5.2.3.2)

New Tools:

Decision Making: This technique is the same as the previously named Group Decision Making Techniques and refers to the various ways that voting can be utilized to reach a conclusion

New Outputs: None

5.6 Control Scope

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	5.6 Control Scope	5.6 Control Scope
Inputs	<ul style="list-style-type: none">.1 Project management plan.2 Requirements documentation.3 Requirements traceability matrix.4 Work performance data.5 Organizational process assets	<ul style="list-style-type: none">.1 Project management plan.2 Project documents.3 Work performance data.4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none">.1 Variance analysis	<ul style="list-style-type: none">.1 Data analysis
Outputs	<ul style="list-style-type: none">.1 Work performance information.2 Change requests.3 Project management plan updates.4 Project documents updates.5 Organizational process assets updates	<ul style="list-style-type: none">.1 Work performance information.2 Change requests.3 Project management plan updates.4 Project documents updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Requirements documentation (described in 5.2.3.1)
- c. Requirements traceability matrix (described in 5.2.3.2)

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Variance analysis (described in 4.5.2.2)
- b. Trend analysis (described in 4.5.2.2)

New Outputs: None

CHAPTER 6: Project Time Management changed to Project Schedule Management

Project scheduling provides a detail plan that represents how and when the project will deliver the products, services and results defined in the project scope and serves as a tool for communication, managing stakeholders' expectations, and as a basis for performance reporting

6.1 Plan Schedule Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	6.1 Plan Schedule Management	6.1 Plan Schedule Management
Inputs	.1 Project management plan .2 Project charter .3 Enterprise environmental factors .4 Organizational process assets	.1 Project charter .2 Project management plan .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	.1 Expert judgment .2 Analytical techniques .3 Meetings	.1 Expert judgment .2 Data analysis .3 Meetings
Outputs	.1 Schedule management plan	.1 Schedule management plan

New Inputs: None

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to alternatives analysis. This can include:

- a-e. Determining which schedule methodology to use, or how to combine various methods
- b-f. Determining how detailed the schedule needs to be
- e-g. The duration of waves for rolling wave planning
- d-h. How often it should be reviewed and updated

New Outputs: None

6.2 Define Activities

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	6.2 Define Activities	6.2 Define Activities
Inputs	.1 Schedule management plan .2 Scope baseline .3 Enterprise environmental factors .4 Organizational process assets	.1 Project management plan .2 Enterprise environmental factors .3 Organizational process assets
Tools & Techniques	.1 Decomposition .2 Rolling wave planning .3 Expert judgment	.1 Expert judgment .2 Decomposition .3 Rolling wave planning .4 Meetings
Outputs	.1 Activity list .2 Activity attributes .3 Milestone list	.1 Activity list .2 Activity attributes .3 Milestone list .4 Change requests .5 Project management plan updates

New Inputs:

Project Management Plan: The component of this document that can be helpful in this process includes, but is not limited to:

- a. Schedule management plan (described in 6.1.3.1) to define the schedule methodology, the duration of waves for rolling wave planning and the level of detail necessary to manage the work
- b. Scope baseline (described in 5.4.3.1)

New Tools:

Meetings: These may be face-to-face, virtual, formal, or informal. It may be held with team members or subject matter experts to define activities needed to complete the work.

New Outputs:

Change Requests: Once the project has been baselined, the progressive elaboration of deliverables into activities may reveal work that was not initially part of the project baselines.

Thus, resulting in a change request, which are processed for review and disposition through the Perform Integrated Change Control process.

Project Management Plan Updates: Any change to the project management plan should go through the organization’s change control process via a change request. Components that may require a change request as a result of this process include, but are not limited to:

- a. Schedule baseline (described in 6.5.3.1)
- b. Cost baseline (described in 7.3.3.1)

6.3 Sequence Activities

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	6.3 Sequence Activities	6.3 Sequence Activities
Inputs	<ul style="list-style-type: none"> .1 Schedule management plan .2 Activity list .3 Activity attributes .4 Milestone list .5 Project scope statement .6 Enterprise environmental factors .7 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Precedence diagramming method (PDM) .2 Dependency determination .3 Leads and lags 	<ul style="list-style-type: none"> .1 Precedence diagramming method .2 Dependency determination and integration .3 Leads and lags .4 Project management information system
Outputs	<ul style="list-style-type: none"> .1 Project schedule network diagrams .2 Project documents updates 	<ul style="list-style-type: none"> .1 Project schedule network diagrams .2 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but is not limited to:

- a. Schedule management plan (described in 6.1.3.1)
- b. Scope baseline (described in 5.4.3.1)

Project Documents: The project documents that can be helpful in this process include, but are not limited to:

- a. Activity attributes (described in 6.2.3.2)
- b. Activity list (described in 6.2.3.1)
- c. Assumption log (described in 4.1.3.2)
- d. Milestone list (described in 6.2.3.3)

New Tools:

Project Management Information System: Includes scheduling software that has the capability to:

- a. Help plan, organize and adjust the sequence of the activities
- b. Insert the logical relationships, leads and lags
- c. Differentiate the different types of dependencies

New Outputs: None

Estimate Activity Resources (5th Ed – Moved)

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	6.4 Estimate Activity Resources	
Inputs	.1 Schedule management plan	(Moved to Resource Management)
	.2 Activity list	
	.3 Activity attributes	
	.4 Resource calendars	
	.5 Risk register	
	.6 Activity cost estimates	
Tools & Techniques	.1 Expert judgment	(Moved to Resource Management)
	.2 Alternative analysis	
	.3 Published estimating data	
	.4 Bottom-Up estimating	
	.5 Project management software	
Outputs	.1 Activity resource requirements	(Moved to Resource Management)

.2 Resource breakdown structure

.3 Project documents updates

New Inputs: (Moved to Resource Management)

New Tools: (Moved to Resource Management)

New Outputs: (Moved to Resource Management)

6.4 Estimate Activity Durations

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	6.5 Estimate Activity Durations	6.4 Estimate Activity Durations
Inputs	<ul style="list-style-type: none">.1 Schedule management plan.2 Activity list.3 Activity attributes.4 Activity resource requirements.5 Resource calendars.6 Project scope statement.7 Risk register.8 Resource breakdown structure.9 Enterprise environmental factors.10 Organizational process assets	<ul style="list-style-type: none">.1 Project management plan.2 Project documents.3 Enterprise environmental factors.4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none">.1 Expert judgment.2 Analogous estimating.3 Parametric estimating.4 Three-point estimating.5 Group decision-making techniques.6 Reserve analysis	<ul style="list-style-type: none">.1 Expert judgment.2 Analogous estimating.3 Parametric estimating.4 Three-point estimating.5 Bottom-up estimating.6 Data analysis.7 Decision making.8 Meetings

Outputs

.1 Activity duration estimates	.1 Duration estimates
.2 Project documents updates	.2 Basis of estimates
	.3 Project documents updates

New Inputs:

Project Management Plan: The component of this document that can be helpful in this process includes, but is not limited to:

- a. Schedule management plan (described in 6.1.3.1) which defines the method used, as well as the level of accuracy and other criteria required to estimate activity duration

Project Documents: The project documents for this process include, but are not limited to:

- a. Activity attributes (described in 6.2.3.2)
- b. Activity list (described in 6.2.3.1)
- c. Assumption log (described in 4.1.3.2)
- d. Lessons learned register (described in 4.4.3.1)
- e. Milestone list (described in 6.2.3.3)
- f. Project team assignments (described in 9.3.3.1)
- g. Resource breakdown structure (described in 9.2.3.3)
- h. Resource calendars (described in 9.2.1.2)
- i. Resource requirements (described in 9.2.3.1)
- j. Risk register (described in 11.2.3.1)

New Tools:

Bottom-up Estimating: A method of estimating product duration or cost by aggregating the estimates of the lower-level components of the WBS.

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Alternatives analysis
- b. Reserve analysis

Meetings: These sessions may be used to estimate activity durations. When using an agile approach they are usually done during a sprint or iteration planning meeting to discuss and prioritize product backlog items to determine which of these items the team will commit to work on in the upcoming iteration.

New Outputs:

Duration Estimates: These are quantitative assessments of the likely number of time periods that are required to complete an activity, phase or a project. They may include some indication of the range of possible results or probability of meeting the estimate.

Basis of Estimates: The detail that can be used to support this process may include, but is not limited to:

- a. Documentation of the basis of the estimate, or how it was developed
- b. Documentation of all assumptions made
- c. Documentation of any known constraints
- d. Indication of the confidence level of the final estimate
- e. Documentation of the individual project risks influencing this estimate

6.5 Develop Schedule

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	6.6 Develop Schedule	6.5 Develop Schedule
Inputs	<ol style="list-style-type: none"> .1 Schedule management plan .2 Activity list .3 Activity attributes .4 Project schedule network Diagrams .5 Activity Resource requirements .6 Resource calendars .7 Activity duration estimates .8 Project scope statement .9 Risk register .10 Project staff assignments .11 Resource breakdown structure .12 Enterprise environmental factors .13 Organizational process assets 	<ol style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Agreements .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ol style="list-style-type: none"> .1 Schedule network analysis .2 Critical path method .3 Critical chain method .4 Resource optimization techniques .5 Modeling techniques .6 Lead and lags 	<ol style="list-style-type: none"> .1 Schedule network analysis .2 Critical path method .3 Resource optimization .4 Data analysis .5 Lead and lags .6 Schedule compression

	.7 Schedule compression	.7 Project management information system
	.8 Scheduling tool	.8 Agile release planning
Outputs	.1 Schedule baseline	.1 Schedule baseline
	.2 Project schedule	.2 Project schedule
	.3 Schedule data	.3 Schedule data
	.4 Project calendars	.4 Project calendars
	.5 Project management plan updates	.5 Change requests
	.6 Project documents updates	.6 Project management plan updates
		.7 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process includes, but are not limited to:

- a. Schedule management plan (described in 6.1.3.1)
- b. Scope baseline (described in 5.4.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Activity attributes (described in 6.2.3.2)
- b. Activity list (described in 6.2.3.1)
- c. Assumption log (described in 4.1.3.2)
- d. Basis of estimates (described in 6.4.3.2)
- e. Duration estimates (described in 6.4.3.1)
- f. Milestone list (described in 6.2.3.3)
- g. Lessons learned register (described in 4.4.3.1)
- h. Project schedule network diagrams (described in 6.3.3.1)
- i. Project team assignments (described in 9.3.3.1)
- j. Resource calendars (described in 9.2.1.2)
- k. Resource requirements (described in 9.2.3.1)
- l. Risk register (described in 11.2.3.1)

Agreements: Documents from sellers or vendors with details of how they will perform the project work to meet contractual commitments

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. What-if scenario analysis
- b. Simulation

Project Management Information system: Includes scheduling software that expedites the process of building a schedule model by generating start and finish dates based on the inputs of activities, network diagrams, resources, and activity durations.

Agile Release Planning: This provides a high-level summary timeline of the release schedule (typically three to six months) based on the product roadmap and the product vision for the product’s evolution. It also determines the number of iterations or sprints in the release, and allows the product owner and team to decide how much needs to be developed and how long it will take to have a releasable product based on business goals, dependencies, and impediments.

New Outputs:

Change Requests: Modifications to the project scope or project schedule may result in Change requests to the scope baseline, and/or other components of the Project management plan. However, they are processed for review and disposition through the Perform Integrated Change Control process.

6.6 Control Schedule

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	6.7 Control Schedule	6.6 Control Schedule
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Project schedule .3 Work performance data .4 Project calendars .5 Schedule data .6 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance data .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Performance reviews .2 Project management software .3 Resource optimization techniques .4 Modeling techniques .5 Lead and lags .6 Schedule compression .7 Scheduling tool 	<ul style="list-style-type: none"> .1 Data analysis .2 Critical path method .3 Project management information system .4 Resource optimization .5 Lead and lags .6 Schedule compression

Outputs	.1 Work performance information	.1 Work performance information
	.2 Schedule forecasts	.2 Schedule forecasts
	.3 Change requests	.3 Change requests
	.4 Project management plan updates	.4 Project management plan updates
	.5 Project documents updates	.5 Project documents updates
	.6 Organizational process assets updates	

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Project calendars (described in 6.5.3.4)
- c. Project schedule (described in 6.5.3.2)
- d. Resource calendars (described in 9.2.1.2)
- e. Schedule data (described in 6.5.3.3)

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Earned value analysis (described in 7.4.2.2)
- b. Iteration burndown chart
- c. Performance reviews
- d. Trend analysis (described in 4.5.2.2)
- e. Variance analysis
- f. What-if scenario analysis (described in 6.5.2.4)

Critical Path Method: Compares the progress along the critical path to determine schedule status, since any variance on that path will have a direct impact on the project date (described in 6.5.2.2)

Project Management Information system: This include scheduling software that provides the ability to track planned dates versus actual dates, to report variances to and progress made against the schedule baseline, and to forecast the effects of changes to the project schedule model.

New Outputs: None

CHAPTER 7: Project Cost Management

7.1 Plan Cost Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	7.1 Plan Cost Management	7.1 Plan Cost Management
Inputs	.1 Project management plan .2 Project charter .3 Enterprise environmental factors .4 Organizational process assets	.1 Project charter .2 Project management plan .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	.1 Expert judgment .2 Analytical techniques .3 Meetings	.1 Expert judgment .2 Data analysis .3 Meetings
Outputs	.1 Cost management plan	.1 Cost management plan

New Inputs: None

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to alternatives analysis. This can be used for:

- a. Reviewing strategic funding options such as self-funding, funding with equity, or funding with debt
- b. Consider ways to acquire project resources such as making, purchasing, renting or leasing

New Outputs: None

7.2 Estimate Costs

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	7.2 Estimate Costs	7.2 Estimate Costs
Inputs	<ul style="list-style-type: none"> .1 Cost management plan .2 Human resource management plan .3 Scope baseline .4 Project schedule .5 Risk register .6 Enterprise environmental factors .7 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Expert judgment .2 Analogous estimating .3 Parametric estimating .4 Bottom-Up estimating .5 Three-point estimating .6 Reserve analysis .7 Cost of quality .8 Project management software .9 Vendor bid analysis .10 Group decision-making techniques 	<ul style="list-style-type: none"> .1 Expert judgment .2 Analogous estimating .3 Parametric estimating .4 Bottom-Up estimating .5 Three-point estimating .6 Data analysis .7 Project management information system .8 Decision making
Outputs	<ul style="list-style-type: none"> .1 Activity cost estimates .2 Basis of estimates .3 Project documents updates 	<ul style="list-style-type: none"> .1 Cost estimates .2 Basis of estimates .3 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to:

- a. Cost management plan (described in 7.1.3.1)
- b. Quality management plan (described in 8.1.3.1)
- c. Scope baseline (described in 5.4.3.1), including the Project scope statement, the WBS and the WBS dictionary

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Project schedule (described in 6.5.3.2)
- c. Resource requirements (described in 9.2.3.1)
- d. Risk register (described in 11.2.3.1)

New Tools:

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Alternatives analysis
- b. Reserve analysis
- c. Cost of quality

Project Management Information system: This can include spreadsheets, simulation software and statistical analysis tools to assist with cost estimating, thus simplifying and facilitating rapid consideration of cost estimate alternatives.

Decision Making: The technique that can be used for this process includes, but is not limited to voting.

New Outputs: None

7.3 Determine Budget

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	7.3 Determine Budget	7.3 Determine Budget
Inputs	<ul style="list-style-type: none"> .1 Cost management plan .2 Scope baseline .3 Activity cost estimates .4 Basis of Estimates .5 Project schedule .6 Resource calendars .7 Risk register .8 Agreements 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Business documents .4 Agreements .5 Enterprise environmental factors .6 Organizational process assets

	.9 Organizational process assets	
Tools & Techniques	.1 Cost aggregation	.1 Expert judgment
	.2 Reserve analysis	.2 Cost aggregation
	.3 Expert judgment	.3 Data analysis
	.4 Historical relationships	.4 Historical relationships
	.5 Funding limit reconciliation	.5 Funding limit reconciliation
		.6 Financing
Outputs	.1 Cost baseline	.1 Cost baseline
	.2 Project funding requirements	.2 Project funding requirements
	.3 Project documents updates	.3 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to:

- a. Cost management plan (described in 7.1.3.1)
- b. Resource management plan (described in 9.1.3.1)
- c. Scope baseline (described in 5.4.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Basis of estimates (described in 6.4.3.2)
- b. Cost estimates (described in 7.2.3.1)
- c. Project schedule (described in 6.5.3.2)
- d. Risk register (described in 11.2.3.1)

Business Documents: The business documents for this process include, but are not limited to:

- a. Business case
- b. Benefit management plan

New Tools:

Data Analysis: The technique that can be used for this process includes, but is not limited to reserve analysis

Financing: For long-term infrastructure, industrial, and public services project, it is common to seek external project funds. However, such funding entity may have certain requirements that are required to be met.

New Outputs: None

7.4 Control Costs

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	7.4 Control Costs	7.4 Control Costs
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Project funding requirements .3 Work Performance Data .4 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Project funding requirements .4 Work performance data .5 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Earned value management .2 Forecasting .3 To-complete performance index (TCPI) .4 Performance reviews .5 Project management software .6 Reserve analysis 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data analysis .3 To-complete performance index .4 Project management information system
Outputs	<ul style="list-style-type: none"> .1 Work performance information .2 Cost forecasts .3 Change requests .4 Project management plan updates .5 Project documents updates .6 Organizational process assets updates 	<ul style="list-style-type: none"> .1 Work performance information .2 Cost forecasts .3 Change requests .4 Project management plan updates .5 Project documents updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to the lessons learned register (described in 4.4.3.1)

New Tools:

Expert Judgment: Examples that can be used for this process include, but are not limited to:

- a. Variance analysis
- b. Earned value management
- c. Forecasting
- d. Financial analysis

Data Analysis: The techniques that can be used for this process include, but are not limited to:

- a. Earned value analysis (described in 7.4.2.2), including planned value (PV), earned value (EV) and actual cost (AC)
- b. Variance analysis (described in 4.5.2.2), including schedule variance (SV), cost variance (CV), schedule performance index (SPI), and cost performance index (CPI)
- c. Trend analysis (described in 4.5.2.2), including charts showing the three earned values, and forecasting for estimate at completion (EAC)
- d. Reserve analysis

Project Management Information system: These are often used to monitor the three EVM dimensions (PV, EV, and AC), to display graphical trends, and to forecast a range of possible final project results.

New Outputs: None

CHAPTER 8: Project Quality Management

8.1 Plan Quality Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	8.1 Plan Quality Management	8.1 Plan Quality Management
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Stakeholder register .3 Risk register .4 Requirements documentation .5 Enterprise environmental factors .6 Organizational process assets 	<ul style="list-style-type: none"> .1 Project charter .2 Project management plan .3 Project documents .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Cost-benefit analysis .2 Cost of quality .3 Seven basic quality tools .4 Benchmarking .5 Design of experiments .6 Statistical sampling .7 Additional quality planning tools .8 Meetings 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Data analysis .4 Decision making .5 Communication Data representation .6 Test and inspection planning .7 Meetings
Outputs	<ul style="list-style-type: none"> .1 Quality management plan .2 Process improvement plan .3 Quality metrics .4 Quality checklists .5 Project documents updates 	<ul style="list-style-type: none"> .1 Quality management plan .2 Quality metrics .3 Project management plan updates .4 Project documents updates

New Inputs:

Project Charter: This high-level document contains the following information that will influence the quality management of the project including, but not limited to:

- a. High-level project description
- b. Product characteristics

- c. Project approval requirements
- d. Measurable project objectives
- e. Related success criteria

Project Documents: The project documents for this process include, but are not limited to:

- a. Requirements documentation (described in 5.2.3.1)
- b. Requirements traceability matrix (described in 5.2.3.2)
- c. Risk register (described in 11.2.3.1)
- d. Stakeholder register (described in 13.1.3.1)

New Tools:

Expert Judgment: Experts should be considered with specialized knowledge or training in the following topics:

- a. Quality assurance
- b. Quality control
- c. Quality measurements
- d. Quality improvements
- e. Quality systems

Data Gathering: This includes activities which can be used for this process, but are not limited to:

- a. Benchmarking
- b. Brainstorming (described in 4.1.2.2)
- c. Interviews (described in 5.2.2.2)

Data Analysis: This includes activities which can be used for this process, but are not limited to:

- a. Cost-benefit analysis
- b. Cost of quality, including prevent, appraisal and failure (internal/external) costs
- c. Matrix diagrams
- d. Mind mapping (described in 5.2.2.3)

Decision Making: This includes techniques which can be used for this process, but are not limited to multi-criteria decision analysis which can be used to identify key issues and suitable alternatives to be prioritized as a set of decisions for implementations. They are used in this process to help prioritize quality metrics.

Communication: Techniques which can be used for this process, but are not limited to:

- a. ~~Flowcharts or process maps~~
- b. ~~Process flows~~
- c. ~~Logical data model~~

Data representation:

- a. Flowcharts

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[b. Logical data model](#)

[c. Matrix diagrams](#)

[e-d. Mind mapping](#)

Test and Inspection Planning: This technique is used to determine how to test or inspect the product, deliverable, or service to meet the stakeholders' needs and expectations. Various types of tests include:

- a. Alpha and beta tests in software projects
- b. Strength tests in construction projects
- c. Inspections in manufacturing
- d. Field tests
- e. Nondestructive tests in engineering

New Outputs:

Project Management Plan Updates: Any change to the project management plan should go through the organization's change control process via a change request. Components that may require a change request may include, but are not limited to:

- a. Risk management plan including decisions as to the greed-upon approach to managing risk
- b. Scope baseline if specific quality management activities need to be added

8.2 Manage Quality

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	8.2 Perform Quality Assurance	8.2 Manage Quality
Inputs	<ul style="list-style-type: none">.1 Quality management plan.2 Quality metrics.3 Process improvement plan.4 Quality control measurements.5 Project documents	<ul style="list-style-type: none">.1 Project management plan.2 Project documents.3 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none">.1 Quality management and control tools.2 Quality audits.3 Process analysis	<ul style="list-style-type: none">.1 Data gathering.2 Data analysis.3 Decision making.4 Communication Data representation.5 Audits

		.6 Design for x
		.7 Problem solving
		.8 Quality improvement methods
Outputs	.1 Change requests	.1 Quality report
	.2 Project management plan updates	.2 Test and evaluation documents
	.3 Project documents updates	.3 Change requests
	.4 Organizational process assets updates	.4 Project management plan updates
		.5 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to the quality management plan

Organizational Process Assets: The assets that can influence this process include, but are not limited to:

- a. Organizational quality management systems that includes policies, procedures and guidelines
- b. Quality templates such as check sheets, traceability matrix, test plans, test documents and others
- c. Results from previous audits
- d. Lessons learned repository

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to checklists.

Data Analysis: This includes activities which can be used for this process, but are not limited to:

- a. Alternatives analysis (described in 9.2.2.5)
- b. Document analysis (described in 5.2.2.3)
- c. Matrix diagrams (described in 8.1.2.3)
- d. Process analysis to identify opportunities for process improvements
- e. Cause-and-effect diagrams
- f. Root cause analysis (RCA)

Decision Making: This includes techniques which can be used for this process, but are not limited to multi-criteria decision analysis which can be used to discuss alternatives that impact project or product quality.

~~**Communication:** Techniques which can be used for this process, but are not limited to:~~

- ~~a. Scatter diagrams~~

- ~~b. Histograms~~
- ~~c. Affinity diagrams~~
- ~~d. Flowcharts~~

Data representation:

- a. Affinity diagrams
- b. Cause and effect diagrams
- c. Flowcharts
- d. Histograms
- e. Matrix diagrams
- f. Scatter diagrams

Design for X: This (DfX) is a set of technical guidelines that may be applied during the design of a product for the optimization of a specific aspect of the design and can control or even improve the product's final characteristics. Direct aspects which may result in cost reduction, quality improvement, better performance and customer satisfaction include:

- a. Reliability
- b. Deployment
- c. Assembly
- d. Manufacturing
- e. Cost
- f. Service
- g. Usability
- h. Safety
- i. Quality

Problem Solving: An effective and system technique that can be used to help eliminate a problem and develop a long-lasting solution. All problem-solving methods include the following elements:

- a. Defining the problem
- b. Identifying the root-cause
- c. Generating possible solutions
- d. Choosing the best solution
- e. Implementing the solution
- f. Verifying the solution effectiveness

Quality Improvement Methods: These techniques that are used to analyze and evaluate opportunities for improvements include, but are not limited to:

- a. Plan-Do-Check-Act
- b. Six Sigma

New Outputs:

Quality Reports: Graphical, numerical or qualitative methods to provide information to help take corrective actions in order to achieve the project quality expectations. The information in the reports may include, but are not limited to:

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- a. Quality management issues escalated by the team
- b. Recommendations for process, project and product improvements
- c. Corrective action recommendations (including rework, defect/bug repair, 100\$ inspection and more)
- d. Summary of findings from the Control Quality process

Test and Evaluation Documents: These documents are input to the Control Quality process and are used to evaluate the achievement of quality objectives. These may include, but are not limited to:

- a. Dedicated checklist
- b. Detailed requirements traceability matrices

8.3 Control Quality

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	8.3 Control Quality	8.3 Control Quality
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Quality metrics .3 Quality checklists .4 Work performance data .5 Approved change requests .6 Deliverables .7 Project documents .8 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Approved change requests .4 Deliverables .5 Work performance data .6 Enterprise environmental factors .7 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Seven basic quality tools .2 Statistical sampling .3 Inspection .4 Approved Change Request Review 	<ul style="list-style-type: none"> .1 Data gathering .2 Data analysis .3 Inspections .4 Testing/product evaluations .5 CommunicationData representations .6 Meetings
Outputs	<ul style="list-style-type: none"> .1 Quality control measurements .2 Validated changes .3 Verified deliverables .4 Work performance information 	<ul style="list-style-type: none"> .1 Quality control measurements .2 Verified deliverables .3 Work performance information .4 Change requests

- .5 Change requests
 - .5 Project management plan updates
 - .6 Project management plan updates
 - .6 Project documents updates
 - .7 Project documents updates
 - .8 Organizational process assets updates
-

New Inputs:

Enterprise Environmental Factors: The factors that can influence this process include, but are not limited to:

- a. Project management information system
- b. Quality management software
- c. Governmental agency regulations
- d. Rules, standards and guidelines

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to:

- a. Checklists (described in 11.2.2.2)
- b. Check sheets
- c. Statistical sampling
- d. Surveys

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Performance reviews
- b. Cause-and-effect diagrams (described in 8.2.2.2)
- c. Root cause analysis (RCA) (described in 8.2.2.2)
- d. Control charts

Testing/Product Evaluations: This is an organized and constructed investigation conducted to provide objective information about the quality of the product or service under test in accordance with the project requirements

~~**Communication:** This includes techniques which can be used for this process, but are not limited to:~~

- ~~a. Scatter diagrams (described in 8.2.2.4)~~
- ~~b. Histograms (described in 8.2.2.4)~~

Data representation:

- a. Cause-and-effect diagrams
- b. Control charts
- c. Histograms
- d. Scatter diagrams

Scatter diagrams

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Meetings: The following types of meetings can be used for this process, but are not limited to:

- a. Approved change requests reviews.
- b. Retrospectives/lessons learned

New Outputs: None

CHAPTER 9: Project Resource Management

Note: The name of this Knowledge Area was changed to reflect that there are resources, beyond human resources, that need to be identified, acquired and managed to achieve a successful completion of the project

9.1 Plan Human Resource Management changed to Plan Resource Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	9.1 Plan Human Resource Management	9.1 Plan Resource Management
Inputs	<ol style="list-style-type: none"> .1 Project management plan .2 Activity resource requirements .3 Enterprise environmental factors .4 Organizational process assets 	<ol style="list-style-type: none"> .1 Project charter .2 Project management plan .3 Project documents .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ol style="list-style-type: none"> .1 Organization charts and position descriptions .2 Networking .3 Organizational theory .4 Expert judgment .5 Meetings 	<ol style="list-style-type: none"> .1 Expert judgment .2 Communication Data representation .3 Organizational theory .4 Meetings
Outputs	<ol style="list-style-type: none"> .1 Human resource management plan 	<ol style="list-style-type: none"> .1 Resource management plan .2 Team charter .3 Project documents updates

New Inputs:

Project Charter: This high-level document contains the following information including, but not limited to:

- a. High-level project description and requirements
- b. Key stakeholder list
- c. Summary milestones
- d. Pre-approved financial resources

Project Documents: The project documents for this process include, but are not limited to:

- a. Project schedule (described in 6.2.3.2)
- b. Requirements documentation (described in 5.2.3.1)
- c. Risk register (described in 11.2.3.1)
- d. Stakeholder register (described in 13.1.3.1)

New Tools:

Communication Data Representation: The techniques that can be used for this process include, but are not limited to:

- a. Hierarchical-type charts
 - Work breakdown structures (WBS)
 - Organizational breakdown structure (OBS)
 - Resource breakdown structure (RBS)

~~b. Matrix-based chart~~

~~b.~~ Responsibility assignment matrix (RAM)

- ~~RACI chart~~

c. Text-oriented formats

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New Outputs:

Team Charter: A document that establishes the team values, agreements and operating guidelines for the team. It may include, but is not limited to:

- a. Team values
- b. Communication guidelines
- c. Decision making criteria and process
- d. Conflict resolution process
- e. Meeting guidelines
- f. Team agreements

Project Documents Updates: Project documents that may be updated as a result of this process may include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Risk register (described in 11.2.3.1)

9.2 Estimate Activity Resources

New Resource Management Process

Estimate Activity Resources: This process was moved from Time Management.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning		9.2 Estimate Activity Resources
Inputs	(Moved from the Project Time Management Knowledge Area)	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	(Moved from the Project Time Management Knowledge Area)	<ul style="list-style-type: none"> .1 Expert judgment .2 Bottom-up estimating .3 Analogous estimating .4 Parametric estimating .5 Data analysis .6 Project management information system .7 Meetings
Outputs	(Moved from the Project Time Management Knowledge Area)	<ul style="list-style-type: none"> .1 Resource requirements .2 Basis of estimates .3 Resource breakdown structure .4 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to:

- a. Resource management plan (described in 9.1.3.1)
- b. Scope baseline (described in 5.4.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Activity attributes (described in 6.2.3.2)
- b. Activity list (described in 6.2.3.1)
- c. Assumption log (described in 4.1.3.2)
- d. Cost estimates (described in 7.2.3.1)

- e. Resource calendars
- f. Risk register (described in 11.2.3.1)

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to alternatives analysis including:

- a. Various levels of resource capability or skills
- b. Different sizes or types of machines
- c. Different tools (manual versus automated)
- d. Make-rent-or-buy decisions

Project Management Information System: This name was changed from the Project Management System in the previous process

Meetings: These include types of meetings which can be used for this process, but are not limited to:

- a. Estimate the resources needed per activity
- b. Level of effort (LoE)
- c. Skill level of the team resources
- d. Quantity of materials needed

New Outputs:

Resource Requirements: This name was changed from the Activity Resource Requirements in the previous process

Basis of Estimates: The amount and type of detail to support this process include, but are not limited to:

- a. Method used to develop the estimate
- b. Resources used to develop the estimate (such as past project information)
- c. Assumptions associated with the estimate
- d. Known constraints
- e. Range of estimates
- f. Confidence level of the estimate
- g. Documentation of identified risks influencing the estimate

9.3 Acquire Project Team to Acquire Resources

Renamed Process

Acquire Resources: Obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	9.2 Acquire Project Team	9.3 Acquire Resources
Inputs	.1 Human resource management plan .2 Enterprise environmental factors .3 Organizational process assets	.1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	.1 Pre-assignment .2 Negotiation .3 Acquisition .4 Virtual teams .5 Multi-criteria decision analysis	.1 Decision making .2 Interpersonal and team skills .3 Pre-assignment .4 Virtual teams
Outputs	.1 Project staff assignments .2 Resource calendars .3 Project management plan updates	.1 Physical resource assignments .2 Resource assignments Project team assignments .3 Resource calendars Change .4 Change requests .5 Project management plan updates .46 Project documents updates .57 Enterprise environmental factors updates .68 Organizational process assets updates

New Inputs:

Physical resource assignments: Documentation of the physical resources assignments records the material, equipment, supplies, and other physical resources that will be used during the project.

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to:

- a. Resource management plan (described in 9.1.3.1)
- b. Procurement management plan (described in 12.1.3.1)
- c. Cost baseline (described in 7.3.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Resource calendars (described in 9.2.1.2)
- b. Resource requirements (described in 9.2.3.1)

- c. Project schedule (described in 6.5.3.2)
- d. Stakeholder register (described in 13.1.3.1)

New Tools:

Decision Making: A technique that can be used to help with the selection of physical project resources or project team members in the process, but is not limited to multi-criteria decision analysis and can include the following selection criteria:

- a. Availability
- b. Cost
- c. Ability
- d. Experience
- e. Knowledge
- f. Skills
- g. Attitude
- h. International factors including location, time zone and communication capabilities

Interpersonal and Team Skills: The skill used for this process include, but is not limited to negotiation. The project management team may need to negotiate with:

- a. Functional managers
- b. Other project management teams within the performing organization
- c. External organizations, vendors, suppliers, contractors when appropriate

New Outputs:

Change Requests: If change requests occur as a result of this process or if recommended corrective or preventive actions impact any of the components of the project management plan or project documents, the project manager needs to submit a change request and follow the Perform Integrated Change Control process

Project Documents Updates: The project documents that may be updated as a result of this process include, but not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Project schedule (described in 6.5.3.2)
- c. Resource breakdown structure (described in 9.2.1.2)
- d. Resource calendars (described in 9.2.1.2)
- e. Resource requirements (described in 9.2.3.1)
- f. Risk register (described in 11.2.3.1)
- g. Stakeholder register (described in 11.1.3.1)

Enterprise Environmental Factors Updates: The factors that are updated for this process include, but is not limited to:

- a. Resource availability within the organization
- b. Amount of the organization's consumable resources that have been used

Organizational Process Assets Updates: The assets that are updated as a result of this process include, but are not limited to documentation related to:

- a. Acquiring resources
- b. Assigning resources
- c. Allocating resources

9.4 Develop Project Team changed to Develop Team

Renamed Process

Develop Team: Improving competencies, team member interaction, and the overall team environment to enhance project performance.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	9.3 Develop Project Team	9.4 Develop Team
Inputs	<ul style="list-style-type: none"> .1 Human resource management plan .2 Project staff assignments .3 Resource calendars 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3. Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Interpersonal Skills .2 Training .3 Team building activities .4 Ground rules .5 Colocation .6 Recognition and rewards .7 Personal assessment tools 	<ul style="list-style-type: none"> .1 Colocation/virtual teams .2 Virtual teamsCommunication technology .3 Communication technologyInterpersonal and team skills .4 Interpersonal and team skillRecognition and rewards .5 Recognition and rewardsTraining .6 TrainingIndividual and team assessments .7 Individual and team assessments .8 Meetings
Outputs	<ul style="list-style-type: none"> .1 Team performance assessments .2 Enterprise environmental factors updates 	<ul style="list-style-type: none"> .1 Team performance assessments .2 Change requests .3 Project management plan updates

.4 Project documents updates

.5 Enterprise environmental factors updates

.6 Organizational process assets updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to the resource management plan providing guidance on:

- a. Providing project team member rewards
- b. Feedback
- c. Additional training
- d. Disciplinary actions as a result of team performance assessment
- e. Team performance assessment criteria

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Project schedule (described in 6.5.3.2)
- c. Project team assignments (described in 9.3.3.1)
- d. Resource calendars (described in 9.2.1.2)
- e. Team charter (described in 9.1.3.2)

Enterprise Environmental Factors: The factors that can influence this process include, but are not limited to:

- a. Human resource management policies regarding
 - Hiring and termination
 - Employee performance reviews
 - Employee development and training records
 - Recognition and rewards
- b. Team member skills, competencies and specialized knowledge
- c. Geographic distribution of team members

Organizational Process Assets: The assets that can influence this process include, but are not limited to:

- a. Historical information
- b. Lessons learned repository

New Tools:

Colocation/Virtual Teams: The placing of many or all of the active team members in the same physical location to enhance their ability to perform as a team is referred to as colocation, or a “tight matrix” and may include, but are not limited to the following strategies:

- a. Team meeting room
- b. Common place to post schedules and other conveniences to enhance communication and a sense of community

Virtual Teams: The use of virtual teams can bring benefits such as the use of more skilled resources, reduced costs, less travel and relocation expenses.

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Communication Technology: Examples of types of technology requirements for collocated and virtual team may include, but are not limited to:

- a. Shared portal
- b. Video conferencing
- c. Audio conferencing
- d. Email/chat

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Conflict management (described in 9.5.2.1)
- b. Influencing (described in 9.5.2.1)
- c. Motivation
- d. Negotiation (described in 12.2.2.5)
- e. Team building

Individual and Team Assessment: Tools that can be used to help assess areas of strengths and weaknesses for this process include, but are not limited to:

- a. Attitudinal surveys
- b. Specific assessments
- c. Structured interviews
- d. Ability tests
- e. Focus groups

Meetings: Meetings that can be used to discuss and address pertinent topics for this process include, but are not limited to:

- a. Project orientation meetings
- b. Team building meetings
- c. Team development meetings

New Outputs:

Change Requests: If change requests occur as a result of this process or if recommended corrective or preventive actions impact any of the components of the project management plan or project documents, the project manager needs to submit a change request and follow the Perform Integrated Change Control process.

Project Documents Updates: The project documents that may be updated as a result of this process include, but not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Project schedule (described in 6.5.3.2)

- c. Project team assignments (described in 9.3.3.1)
- d. Resource calendars (described in 9.2.1.2)
- e. Team charter (described in 9.1.3.2)

Organizational Process Assets Updates: The assets that are updated as a result of this process include, but are not limited to:

- a. Training requirements
- b. Personnel assessment

9.5 Manage Project Team changed to Manage Team

Renamed Process

Manage Team: Tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	9.4 Manage Project Team	9.5 Manage Team
Inputs	<ul style="list-style-type: none"> .1 Human resource management plan .2 Project staff assignments .3 Team performance assessments .4 Issue log .5 Work performance reports .6 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance reports .4 Team performance assessments .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Observation and conversation .2 Project performance appraisals .3 Conflict management .4 Interpersonal skills 	<ul style="list-style-type: none"> .1 Interpersonal and team skills .2 Project management information system
Outputs	<ul style="list-style-type: none"> .1 Change requests .2 Project management plan updates .3 Project documents updates .4 Enterprise environmental factors updates .5 Organizational process assets updates 	<ul style="list-style-type: none"> .1 Change requests .2 Project management plan updates .3 Project documents updates .4 Enterprise environmental factors updates .5 Organizational process assets updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to the resource management plan providing guidance on how the project team resources should be managed and eventually released.

Project Documents: The project documents for this process include, but are not limited to:

- a. Issue log (described in 4.3.3.3)
- b. Lessons learned register (described in 4.4.3.1)
- c. Project team assignments (described in 9.3.3.1)
- d. Team charter (described in 9.1.3.2)

Enterprise Environmental Factors: The factors that can be helpful in this process include, but are not limited to human resource management policies.

New Tools:

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Conflict management
- b. Decision making (described in 5.2.2.4)
- c. Emotional intelligence
- d. Influencing
- e. Leadership

Project Management Information System: Software including resource management scheduling support that can be used for managing and coordinating team members across project activities.

9.6 Control Resources

New Process

Control Resources: Ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action as necessary.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling		9.6 Control Resources
Inputs		<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance data .4 Agreements .5 Organizational process assets
Tools & Techniques		<ul style="list-style-type: none"> .1 Data analysis .2 Problem solving .3 Interpersonal and team skills .4 Project management information system
Outputs		<ul style="list-style-type: none"> .1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates

New Inputs:

Project Management Plan: The components of this document that can be helpful in this process include, but are not limited to the resource management plan providing guidance on how the project team resources should be managed and eventually released.

Project Documents: The project documents for this process include, but are not limited to:

- a. Issue log (described in 4.3.3.3)
- b. Lessons learned register (described in 4.4.3.1)
- c. Resource assignments (described in 9.3.3.1)
- d. Project schedule (described in 6.5.3.2)
- e. Resource breakdown structure (described in 9.2.3.3)
- f. Resource requirements (described in 9.2.3.1)
- g. Risk register (described in 11.2.3.1)

Work performance data: The data included on project status for this process include, but are not limited to the number and type of resources that have been used.

Agreements: Agreements made within the context of the project are the basis for all resources external to the organization and should define procedures when new, unplanned resources are needed or when issues arise with current resources.

Organization Process Assets: The assets that can influence this process include, but are not limited to:

- a. Policies regarding resource control and assignment
- b. Escalation procedures for handling issues within the performing organization
- c. Lessons learned repository from previous similar projects

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Alternatives analysis (described in 9.2.2.5)
- b. Cost-benefit analysis (described in 8.1.2.3)
- c. Performance reviews
- d. Trend analysis (described in 4.5.2.2)

Problem Solving: This includes a set of tools to solve problems. The methodical steps to deal with problem solving can include:

- a. Identify and specify the problem
- b. Define the problem by breaking it into smaller, manageable problems
- c. Investigate and collect data
- d. Analyze to find the root cause of the problem
- e. Solve by choosing the most suitable solution from available ones
- f. Check the solution to determine if the problem has been fixed

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Negotiation (described in 12.2.2.5)
- b. Influencing (described in 9.5.2.1)

Project Management Information System: Software including resource management and scheduling capabilities that can be used to monitor the resource utilization to help ensure that the right resources are working on the right activities at the right time and place.

New Outputs:

Work Performance Information: Information on how the project work is performing by comparing resource requirements and resource allocations to resource utilization across the project activities

Change Requests: If change requests occur as a result of this process or if recommended corrective or preventive actions impact any of the components of the project management plan or project documents,

the project manager needs to submit a change request and follow the Perform Integrated Change Control process

Project Management Plan Updates: Components of the project management plan that may require a change request as a result of this process include, but not limited to:

- a. Resource management plan (described in 9.1.3.1)
- b. Schedule baseline (described in 6.5.3.1)
- c. Cost baseline (described in 7.3.3.1)

Project Documents Updates: The project documents that may be updated as a result of this process include, but not limited to:

- a. Assumption log (described in 4.1.3.2)
 - b. Issue log (described in 4.3.3.3)
 - c. Lessons learned register (described in 4.4.3.1)
 - d. Resource assignments (described in 9.3.3.1)
 - e. Resource breakdown structure (described in 9.2.3.3)
 - f. Risk register (described in 11.2.3.1)
-

CHAPTER 10: Project Communications Management ~~changed to Project Communication Management~~

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Communications refers to a system or technology for transmitting information.
 Communication refers to the exchange of messages between individuals.
 Communications is technology; whereas, communication is human.

10.1 Plan Communications Management ~~changed to Plan Communication Management~~

Renamed Process

Changed process name from Plan Communications Management to Plan Communication Management.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	10.1 Plan Communications Management	10.1 Plan Communications Management
Inputs	.1 Project management plan .2 Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets	.1 Project charter .2 Project management plan .3 Project documents .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	.1 Communication requirements analysis .2 Communication technology .3 Communication models .4 Communication methods .5 Meetings	.1 Expert judgment .2 Communication requirements analysis .3 Communication technology .4 Communication models .5 Communication methods .6 Interpersonal and team skills .7 Data analysis representation .8 Meetings
Outputs	.1 Communications management plan .2 Project documents updates	.1 Communications management plan .2 Project management plan updates .3 Project documents updates

New Inputs:

Project Charter: The high-level project document identifies the key stakeholders and may contain information about the roles and responsibilities of the stakeholders

Project Documents: The project documents that may be considered as input to this process include, but not limited to:

- a. Requirements documentation (described in 5.2.3.1)
- b. Stakeholder register (described in 13.1.3.1)

New Tools:

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge or training in the topics that include, but are not limited to:

- a. Politics and power structures in the organization
- b. Environment and culture of the organization and other customer organizations
- c. Resource breakdown structure (described in 9.2.1.2)
- d. Industry or type of project deliverables
- e. Corporate communications technologies
- f. Corporate policies and procedures regarding legal requirements of corporate communications
- g. Corporate policies and procedures regarding security
- h. Stakeholders, including customers or sponsors

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Communication styles assessment
- b. Political awareness
- c. Cultural awareness

~~**Data Analysis:** This includes techniques which can be used for this process, but are not limited to a stakeholder engagement assessment matrix to assess requirements for additional communications through comparisons between the current engagement levels and desired engagement levels~~

~~**Data Representation:** A data representation technique that can be used for this process include, but not limited to a stakeholder engagement assessment matrix:~~

- ~~a. Stakeholder engagement assignment matrix~~

New Outputs:

Project Management Plan Updates: Components of the project management plan that may require a change request as a result of this process include, but not limited to the stakeholder engagement plan. It may be updated to reflect any processes, procedures, tools or techniques that affect the engagement of stakeholders in project decisions and execution.

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10.2 Manage Communications

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	10.2 Manage Communications	10.2 Manage Communications
Inputs	<ol style="list-style-type: none"> .1 Communications management plan .2 Work performance reports .3 Enterprise environmental factors .4 Organizational process assets 	<ol style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work Performance reports .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ol style="list-style-type: none"> .1 Communication technology .2 Communication models .3 Communication methods .4 Information management systems .5 Performance reporting 	<ol style="list-style-type: none"> .1 Communication technology .2 Communication methods .3 Communication skills .4 Project management information system .5 Project reporting .6 Interpersonal and team skills .7 Meetings
Outputs	<ol style="list-style-type: none"> .1 Project communications .2 Project management plan updates .3 Project documents updates .4 Organizational process assets updates 	<ol style="list-style-type: none"> .1 Project communications .2 Project management plan updates .3 Project documents updates .4 Organizational process assets updates

New Inputs:

Project Management Plan: The project management plan components that can be helpful in this process include, but are not limited to:

- a. Resource management plan (described in 9.1.3.1)
- b. Communications management plan (described in 10.1.3.1)
- c. Stakeholder engagement plan (described in 13.2.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Change log (described in 4.6.3.1)
- b. Issue log (described in 4.3.3.3)
- c. Lessons learned register (described in 4.4.3.1)
- d. Quality report (described in 8.2.3.1)
- e. Risk report (described in 11.2.3.2)
- f. Stakeholder register (described in 13.1.3.1)

New Tools:

Communication Skills: Skills that can be used for this process include, but are not limited to:

- a. Communication competence
- b. Feedback
- c. Nonverbal
- d. Presentations

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Active listening
- b. Conflict management (described in 9.5.2.1)
- c. Cultural awareness (described in 10.1.2.6)
- d. Meeting management
- e. Networking
- f. Political awareness

Meetings: These support the actions defined in the communications strategy and communications plan

New Outputs: None

10.3 Control Communications changed to Monitor Communications

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	10.3 Control Communications	10.3 Monitor Communications
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Project communications .3 Issue log .4 Work performance data 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance data .4 Enterprise environmental factors

	.5 Organizational process assets	.5 Organizational process assets
Tools & Techniques	.1 Information management systems	.1 Expert judgment
	.2 Expert judgment	.2 Project management information system
	.3 Meetings	.3 Data analysis
		.4 Interpersonal and team skills
		.5 Meetings
Outputs	.1 Work performance information	.1 Work performance information
	.2 Change requests	.2 Change request
	.3 Project management plan updates	.3 Project management plan updates
	.4 Project documents updates	.4 Project documents updates
	.5 Organizational process assets updates	

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Issue log (described in 4.3.3.3)
- b. Lessons learned register (described in 4.4.3.1)
- c. Project communications (described in 10.2.3.1)

Enterprise Environmental Factors: The facts that can influence this process include, but are not limited to:

- a. Organizational culture, political climate and governance framework
- b. Established communication channels, tools and systems
- c. Global, regional, or local trends, practices, or habits
- d. Geographic distribution of facilities and resources

New Tools:

Project Management Information System: The systems that provide a set of standard tools for project managers to capture, store and distribute information to internal and external stakeholders with the information they need according to the communications plan.

Data Analysis: This includes techniques which can be used for this process, but are not limited to a stakeholder engagement assessment matrix to assess requirements for additional communications through the review of changes between desired and current engagement and adjusting communications are necessary

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to observation/conversation to enable the project manager to identify:

- a. Issues within the team
- b. Conflicts between people
- c. Individual performance issues

New Outputs: None

CHAPTER 11: Project Risk Management

11.1 Plan Risk Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	11.1 Plan Risk Management	11.1 Plan Risk Management
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Project charter .3 Stakeholder register .4 Enterprise environmental factors .5 Organizational process assets 	<ul style="list-style-type: none"> .1 Project charter .2 Project management plan .3 Project documents .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Analytical techniques .2 Expert judgment .3 Meetings 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data analysis .3 Meetings
Outputs	<ul style="list-style-type: none"> .1 Risk management plan 	<ul style="list-style-type: none"> .1 Risk management plan

New Inputs:

Project Documents: The project documents for this process include, but are not limited to the stakeholder register which contains details of the project’s stakeholders and provides an overview of their project roles and their attitude toward risk on the project

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to a stakeholder analysis to determine the risk appetite of project stakeholders.

New Outputs: None

11.2 Identify Risks

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	11.2 Identify Risks	11.2 Identify Risks
Inputs	<ul style="list-style-type: none"> .1 Risk management plan .2 Cost management plan .3 Schedule management plan .4 Quality management plan .5 Human resource management plan .6 Scope baseline .7 Activity cost estimates .8 Activity duration estimates .9 Stakeholder register .10 Project documents .11 Procurement documents .12 Enterprise environmental factors .13 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Agreements .4 Procurement documentation .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Documentation reviews .2 Information gathering techniques .3 Checklist analysis .4 Assumptions analysis .5 Diagramming techniques .6 SWOT analysis .7 Expert judgment 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Data analysis .4 Interpersonal and team skills .5 Prompt lists .6 Meetings
Outputs	<ul style="list-style-type: none"> .1 Risk register 	<ul style="list-style-type: none"> .1 Risk register .2 Risk report .3 Project documents updates

New Inputs:

Project Management Plan: The project management plan components that can be helpful in this process include, but are not limited to:

- a. Requirements management plan (described in 5.1.3.2)
- b. Schedule management plan (described in 6.1.3.1)
- c. Cost management plan (described in 7.1.3.1)
- d. Resource management plan (described in 9.1.3.1)
- e. Quality management plan (described in 8.1.3.1)
- f. Risk management plan (described in 11.1.3.1)
- g. Scope baseline (described in 5.4.3.1)
- h. Schedule baseline (described in 6.5.3.1)
- i. Cost baseline (described in 7.3.3.1)

Project Management Plan: If the project requires external procurement of resources, the agreements will contain the following information, but not limited to:

- a. Milestone dates
- b. Contract type
- c. Acceptance criteria
- d. Awards and penalties that can present threats or opportunities

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to:

- a. Brainstorming
- b. Checklists
- c. Interviews

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Root cause analysis
- b. Assumption and constraint analysis
- c. SWOT analysis
- d. Document analysis (described in 5.2.2.3)

~~**Interpersonal and Team Skills:** Skills that can be used for this process include, but are not limited to facilitation~~

~~**Prompt list:** A predetermined list of risk categories that are the lowest level of the risk breakdown structure and are used to help identify individuals risks for this process include, but are not limited to:~~

- ~~a. PESTLE (political, economic, social, technological, legal, environmental)~~
- ~~b. TECOP (technical, environmental, commercial, operations, political)~~
- ~~c. VUCA (volatility, uncertainty, complexity, ambiguity)~~

Meetings: Specialized meetings (often called a risk workshop) can be used for this process include, but are not limited to some type of brainstorming or facilitated workshop

New Outputs:

Risk report: Presents information on overall project risk, together with summary information on identified individual project risks. This information may include, but is not limited to:

- a. Sources of overall project risk, indicate the most important drivers of overall project risk exposure
- b. Summary information on identified individual project risks
 - Number of identified threats and opportunities
 - Distribution of risks across risk categories
 - Metrics and trends
- c. Additional information depending on the reporting requirements specified in the risk management plan

Project Documents Updates: The project documents that may be updated as a result of this process include, but not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Issue log (described in 4.3.3.3)
- c. Lessons learned register (described in 4.4.3.1)

11.3 Perform Qualitative Risk Analysis

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	11.3 Perform Qualitative Risk Analysis	11.3 Perform Qualitative Risk Analysis
Inputs	<ul style="list-style-type: none"> .1 Risk management plan .2 Scope baseline .3 Risk register .4 Enterprise environmental factors .5 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Risk probability and impact assessment .2 Probability and impact matrix .3 Risk data quality assessment .4 Risk categorization 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Data analysis .4 Interpersonal and team skills

	.5 Risk urgency assessment	.5 Risk categorization
	.6 Expert judgment	.6 Communication <u>Data representation</u>
		.7 Meetings
Outputs	.1 Project documents updates	.1 Project documents updates

New Inputs:

Project Management Plan: The project management plan components that can be helpful in this process includes, but not limited to the risk management plan. Of particular interest in this process are:

- a. Roles and responsibilities for conducting risk management
- b. Budget for risk management
- c. Schedule activities for risk management
- d. Risk categories, often defined in a risk breakdown structure
- e. Definitions of probability and impact
- f. Probability and impact matrix
- g. Stakeholders' risk thresholds

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Risk register (described in 11.2.3.1)
- c. Stakeholder register (described in 13.1.3.1)

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to structured or semi-structured interviews to assess the probability and impacts of individual project risks

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Risk data quality assessment
- b. Risk probability and impact assessment
- c. Assessment of other risk parameters
 - Urgency
 - Proximity
 - Dormancy
 - Manageability
 - Controllability
 - Detectability
 - Connectivity
 - Strategic impact
 - Propinquity (the degree to which a risk is perceived to matter by either an individual or group)

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to facilitation.

Data Representation: A data representation technique that can be used during this process include, but not limited to:

- a. Probability and impact matrix
- b. Hierarchical-type charts

Communication: Techniques that can be used for this process include, but are not limited to:

- a. Probability and impact matrix (described in 11.1.3.1)
- b-c. Hierarchical-type charts (including a bubble chart to display three-dimensional data)

Meetings: Specialized meetings (often called a risk workshop) can be used for this process include, but are not limited to:

- a. Review previously identified risks
- b. Assessment probably and impact and possibly other risk parameters

New Outputs: None

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11.4 Perform Quantitative Risk Analysis

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	11.4 Perform Quantitative Risk Analysis	11.4 Perform Quantitative Risk Analysis
Inputs	<ul style="list-style-type: none"> .1 Risk management plan .2 Cost management plan .3 Schedule management plan .4 Risk register .5 Enterprise environmental factors .6 Organizational process assets 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Data gathering and representation techniques .2 Quantitative risk analysis and modeling techniques .3 Expert judgment 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Interpersonal and team skills

Outputs

.1 Project documents updates

.1 Project documents updates

New Inputs:

Project Management Plan: The project management plan components that can be helpful in this process include, but not limited to:

- a. Risk management plan (described in 11.1.3.1)
- b. Scope baseline (described in 5.4.3.1)
- c. Schedule baseline (described in 6.5.3.1)
- d. Cost baseline (described in 7.3.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Basis of estimates (described in 6.4.3.2)
- c. Cost estimates (described in 7.2.3.1)
- d. Cost forecasts (described in 7.4.3.2)
- e. Duration estimates (described in 6.4.3.1)
- f. Milestone list (described in 6.2.3.3)
- g. Resource requirements (described in 9.2.3.1)
- h. Risk register (described in 11.2.3.1)
- i. Risk report (described in 11.2.3.2)
- j. Schedule forecasts (described in 6.6.3.2)

New Tools:

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to facilitation.

Representations of Uncertainty: Individual project risks are input into a quantitative risk analysis model to reflect uncertainty which is represented as a probability distribution. The most commonly used are:

- a. Triangular
- b. Normal
- c. Lognormal
- d. Beta
- e. Uniform
- f. Discrete distributions

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Simulations
- b. Sensitivity analysis
- c. Decision tree analysis
- d. Influence diagrams

New Outputs: None

11.5 Plan Risk Responses

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	11.5 Plan Risk Responses	11.5 Plan Risk Responses
Inputs	<ul style="list-style-type: none"> .1 Risk management plan .2 Risk register 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Strategies for negative risks or threats .2 Strategies for positive risks or opportunities .3 Contingent response strategies .4 Expert judgment 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Interpersonal and team skills .4 Strategies for threats .5 Strategies for opportunities .6 Contingent response strategies .7 Strategies for overall project risk .8 Data analysis .9 Decision making
Outputs	<ul style="list-style-type: none"> .1 Project management plan updates .2 Project documents updates 	<ul style="list-style-type: none"> .1 Change requests .2 Project management plan updates .3 Project documents updates

New Inputs:

Project Management Plan: Project management plan components that can be helpful in the process include, but not limited to:

- a. Resource management plan (described in 9.1.3.1)
- b. Risk management plan (described in 11.1.3.1)
- c. Cost baseline (described in 7.3.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Project schedule (described in 6.5.3.2)
- c. Resource breakdown structure (described in 9.2.3.3)
- d. Resource calendars (described in 9.2.1.2)
- e. Risk register (described in 11.2.3.1)
- f. Risk report (described in 11.2.3.2)
- g. Stakeholder register (described in 13.1.3.1)

Enterprise Environment Factors: The factor that can influence this process include, but are not limited to the risk appetite and thresholds of key stakeholders.

Organizational Process Assets: The assets that can influence this process include, but are not limited to:

- a. Templates for the risk management plan, risk register and risk report
- b. Historical databases
- c. Lessons learned repositories from similar completed projects

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to interviews using either structured or semi-structured interviews.

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to facilitation.

Strategies for Overall Project Risk: The strategies for individual projects risks should also be planned and implemented to address overall project risks. The same risk response strategies that apply are:

- a. Avoid
- b. Exploit
- c. Mitigate/Enhance
- d. Accept

Data Analysis: A number of alternative risk response strategies may be considered. Data analysis techniques that can be used to select a preferred risk strategy include but are not limited to:

- a. Alternatives analysis
- b. Cost-benefit analysis

Cost-benefit analysis

Decision Making: Decision making techniques that can be used to select the preferred risk response strategy include but are not limited to:

- ~~a-c.~~ Alternatives analysis
- ~~b-d.~~ Multicriteria decision analysis
- ~~c-e.~~ Cost-benefit analysis

New Outputs:

Change Requests: Planned risk responses may result in a change request to the cost and schedule baselines or other components of the project management plan. Change requests are processed for review and disposition through the Perform Integrated Change Control process.

11.6 Implement Risk Responses

New Process

Implement Risk Responses: It ensures that agreed upon risk responses are executed as planned in order to address overall project risk exposure, minimize individual project threats, and maximize individual project opportunities.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing		11.6 Implement Risk Responses
Inputs		.1 Project management plan .2 Project documents .3 Organizational process assets
Tools & Techniques		.1 Expert judgment .2 Resource allocation .3 Interpersonal and team skills .4 Project management information system
Outputs		.1 Change requests .2 Project documents updates

New Inputs:

Project Management Plan: If the project requires external procurement of resources, the agreements will contain the following information, but not limited to the risk management plan.

Project Documents: The project documents for this process include, but are not limited to:

- a. Lessons learned register (described in 4.4.3.1)
- b. Risk register (described in 11.2.3.1)
- c. Risk report (described in 11.2.3.2)

Organizational Process Assets: The assets that can influence this process include but are not limited to the lessons learned repository from similar completed projects that indicate the effectiveness of particular risk responses.

New Tools:

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge to validate or modify risk responses if necessary, and decide how to implement them in the most efficient and effective manner.

~~**Resource Allocation:** Having validated and confirmed the risk responses, the necessary resources should be allocated to each action associated with a risk response plan. This resource allocation is performed by following the Acquire Resources process. These resources include but are not limited to:~~

- ~~a. Suitably qualified and experienced personnel to execute the agreed-upon action~~
- ~~b. Specific budget and time allowance for the action~~
- ~~c. Any required technical resources to complete the action~~

Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to influencing to encourage nominated risk owners to take necessary action where required

Project Management Information System: System that includes schedule, resource and cost software to ensure that agreed-upon risk response plans and their associated activities are integrated into the project alongside other project activities

New Outputs:

Change Requests: Implementation of risk responses may result in a change request to the cost and schedule baselines or other components of the project management plan. Change requests are processed for review and disposition through the Perform Integrated Change Control process.

Project Documents Updates: The project documents that may be updated as a result of this process include, but not limited to:

- a. Issue log (described in 4.3.3.3)
- b. Lessons learned register (described in 4.4.3.1)
- c. Risk register (described in 11.2.3.1)
- d. Risk report (described in 11.2.3.2)

11.7 Control Risks changed to Monitor Risks

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	11.6 Control Risks	11.7 Monitor Risks
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Risk register .3 Work performance data .4 Work performance reports 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance data .4 Work performance reports
Tools & Techniques	<ul style="list-style-type: none"> .1 Risk reassessment .2 Risk audits .3 Variance and trend analysis .4 Technical performance measurement .5 Reserve analysis .6 Meetings 	<ul style="list-style-type: none"> .1 Data analysis .2 Audits .3 Meetings
Outputs	<ul style="list-style-type: none"> .1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates .5 Organizational process assets updates 	<ul style="list-style-type: none"> .1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates .5 Organizational process assets updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Issue log (described in 4.3.3.3)
- b. Lessons learned register (described in 4.4.3.1)
- c. Risk register (described in 11.2.3.1)
- d. Risk report (described in 11.2.3.2)

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Technical performance analysis
- b. Reserve analysis

Audits: Risk audit are a type of audit that may be used to consider the effectiveness of the risk management process.

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New Outputs: None

CHAPTER 12: Project Procurement Management

12.1 Plan Procurement Management

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	12.1 Plan Procurement Management	12.1 Plan Procurement Management
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Requirement documentation .3 Risk register .4 Activity resource requirements .5 Project schedule .6 Activity cost estimates .7 Stakeholder register .8 Enterprise environmental factors .9 Organizational process assets 	<ul style="list-style-type: none"> .1 Project charter .2 Business documents .3 Project management plan .4 Project documents .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Make-or-buy analysis .2 Expert judgment .3 Market research .4 Meetings 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Data analysis .4 Source selection analysis .5 Meetings
Outputs	<ul style="list-style-type: none"> .1 Procurement management plan .2 Procurement statement of work .3 Procurement documents .4 Source selection criteria .5 Make-or-buy decisions .6 Change requests .7 Project documents updates 	<ul style="list-style-type: none"> .1 Procurement management plan .2 Procurement strategy .3 Bid documents .4 Procurement statement of work .5 Source selection criteria .6 Make-or-buy decisions .7 Independent cost estimates .8 Change Request .9 Project documents updates .10 Organizational process assets

New Inputs:

Project Charter: The high-level project document includes, but is not limited to:

- a. Objectives
- b. Project description
- c. Summary milestones
- d. Preapproved financial resources

Business Documents: The business documents for this process include, but are not limited to:

- a. Business case
- b. Benefits management plan

Project Documents: The project documents for this process include, but are not limited to:

- a. Milestone list (described in 6.2.3.3)
- b. Project team assignments (described in 9.3.3.1)
- c. Requirements documentation (described in 5.2.3.1)
 - Requirements management plan
 - Technical requirements that the seller is required to satisfy
 - Requirements with contractual and legal implications (including health, safety, security, performance, environmental, insurance, intellectual property rights, equal employment opportunity, licenses, permits and other nontechnical requirements)
- d. Requirements traceability matrix (described in 5.2.3.2)
- e. Resource requirements (described in 9.2.3.1)
- f. Risk register (described in 11.2.3.1)
- g. Stakeholder register (described in 13.1.3.1)

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to market research.

Data Analysis: This includes techniques which can be used for this process, but are not limited to make-or-buy analysis which may use the following, but not limited to:

- a. Return on investment (ROI)
- b. Internal rate of return (IRR)
- c. Discounted cash flow
- d. Net present value (NPV)
- e. Benefit/cost analysis (BCA)

Source Selection Analysis: Commonly used selection methods, which can be used for this process, but are not limited to:

- a. Least cost
- b. Qualifications only

- c. Quality-based/highest technical proposal score
- d. Quality and cost-based
- e. Sole source
- f. Fixed budget

New Outputs:

Procurement Strategy: Once a decision is made to acquire from outside the project the procurement strategy determines the project delivery method, the type of legally binding agreement(s) and how the procurement will advance through the procurement phases. Included in this strategy but not limited to:

- a. Delivery methods
 - For professional services, this includes
 - buyer/services provider with no subcontracting
 - buyer/services provider with subcontracting allowed
 - joint venture between buyer and services provider
 - buyer/services provider acts as the representative
 - For industrial or commercial construction this includes, but not limited to
 - turnkey
 - design/build (DB)
 - design bid build (DBB)
 - design build operate (DBO)
 - build own operate transfer (BOOT)
- b. Contract payment types
 - Fixed price
 - Cost plus
 - Incentives and awards
- c. Procurement phases

Bid Documents: Commonly used documents for soliciting proposals from prospective sellers, which can be used for this process, but are not limited to:

- a. Request for information (RFI)
- b. Request for quote (RFQ)
- c. Request for proposal (RFP)

Independent Cost Estimates: A cost estimate prepared either by the procuring organization or an outside professional estimator to service as a benchmark on proposed responses. Significant differences in cost estimates can be an indication that the procurement SOW was deficient or ambiguous, or that the prospective sellers either misunderstood or failed to respond fully to the procurement SOW.

Organizational Process Assets: Assets updated as a result of this process include but are not limited to information on qualified sellers

12.2 Conduct Procurements

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	12.2 Conduct Procurements	12.2 Conduct Procurements
Inputs	<ol style="list-style-type: none"> .1 Procurement management plan .2 Procurement documents .3 Source selection criteria .4 Seller proposals .5 Project documents .6 Make-or-buy decisions .7 Procurement statement of work .8 Organizational process assets 	<ol style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Procurement documentation .4 Seller proposals .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	<ol style="list-style-type: none"> .1 Bidder conference .2 Proposal evaluation techniques .3 Independent estimates .4 Expert judgment .5 Advertising .6 Analytical techniques .7 Procurement negotiations 	<ol style="list-style-type: none"> .1 Expert judgment .2 Advertising .3 Bidder conferences .4 Data analysis .5 Negotiation
Outputs	<ol style="list-style-type: none"> .1 Selected sellers .2 Agreements .3 Resource calendars .4 Change requests .5 Project management plan updates .6 Project documents updates 	<ol style="list-style-type: none"> .1 Selected sellers .2 Agreements .3 Change requests .4 Project management plan updates .5 Project documents updates .6 Organizational process assets updates

New Inputs:

Project Management Plan: Project management plan components that can be helpful in this process include, but not limited to:

- a. Scope management plan (described in 5.1.3.1)
- b. Requirements management plan (described in 5.1.3.2)

- c. Communications management plan (described in 10.1.3.1)
- d. Risk management plan (described in 11.1.3.1)
- e. Procurement management plan (described in 12.1.3.1)
- f. Configuration management plan (described in 5.6.1.1)
- g. Cost baseline (described in 7.3.3.1)

Enterprise Environment Factors: Factors that can influence this process include, but are not limited to:

- a. Local laws and regulations regarding procurements
- b. Local laws and regulations ensuring that the major procurements involve local providers and suppliers
- c. External economic environment constraining procurement processes
- d. Marketplace conditions
- e. Information on relevant past experience with sellers, both good and bad
- f. Prior agreements already in place
- g. Contract management systems

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to proposal evaluation which includes, but not limited to:

- a. Ensuring that proposal is complete
- b. Response has been received full to the
 - Procurement documents
 - SOW
 - Source selection criteria
 - any other documents that went out in the bid package

New Outputs:

Organization Process Assets: Assets that can be updated as a result of this process include, but are not limited to:

- a. Listings of prospective and prequalified sellers
 - b. Information on relevant experience with sellers, both good and bad
-

12.3 Control Procurements

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	12.3 Control Procurements	12.3 Control Procurements
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Procurement documents .3 Agreements .4 Approved change requests .5 Work performance reports .6 Work performance data 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Agreements .4 Procurement documentation .5 Approved change requests .6 Work performance data .7 Enterprise environmental factors .8 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Contract change control system .2 Procurement performance reviews .3 Inspections and audits .4 Performance reporting .5 Payment systems .6 Claims administrations .7 Records management system 	<ul style="list-style-type: none"> .1 Expert judgment .2 Claims administration .3 Data analysis .4 Inspections .5 Audits 6. Payment systems
Outputs	<ul style="list-style-type: none"> .1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates .5 Organizational process assets updates 	<ul style="list-style-type: none"> .1 Closed procurements .2 Work performance information .3 Procurement documentation updates .4 Change requests .5 Project management plan updates .6 Project documents updates .7 Organizational process assets updates

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Lessons learned register (described in 4.4.3.1)

- c. Milestone list (described in 6.2.3.3)
- d. Quality reports (described in 8.2.3.1)
- e. Requirements documentation (described in 5.2.3.1)
- f. Requirements traceability matrix (described in 5.2.3.2)
- g. Risk register (described in 11.2.3.1)
- h. Stakeholder register (described in 13.1.3.1)

Enterprise Environmental Factors: Factors which can influence this process include, but are not limited to:

- a. Marketplace conditions
- b. Financial management system
- c. Buying organization's code of ethics

Organization Process Assets: Assets which can influence this process include, but are not limited to procurement policies.

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Performance reviews
- b. Earned value analysis (EVA) (described in 7.4.2.2)
- c. Trend analysis (described in 4.5.2.2)

New Outputs:

Closed Procurements: The buyer, usually through its authorized procurement administrator, provides the seller with formal written notice that the contract has been completed. Requirements for formal procurement closure are usually defined in the terms and conditions of the contract and are included in the procurement management plan. Typically, all deliverables should have been provided on time and meet technical and quality requirements, there should be no outstanding claims or invoices, and all final payments should have been made. The project management team should have approved all deliverables prior to closure.

Procurement Documentation Updates: The documentation regarding procurements includes but it not limited to:

- a. Supporting schedules
- b. Requested unapproved contract changes
- c. Approved change requests
- d. Seller-developed technical documentation and other work performance information, such as deliverables, seller performance reports and warranties
- e. Financial documents including invoices and payment records
- f. Results of contract-related inspections

Close Procurements (5th Ed – Removed)

Note: This Close Procurements process in the 5th edition has been removed. The function of the Close Procurement process is now captured within Control Procurements and Close Project or Phase.

Research shows that few project managers have the authority to formally and legally close a contract. Project managers are responsible to determine that work is complete, records are indexed and archived, and responsibilities are transferred appropriately. Thus, work associated with Close Procurements is now within the Control Procurement processes.

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Closing	12.4 Close Procurements	
Inputs	.1 Project management plan .2 Procurement documents	
Tools & Techniques	.1 Procurement audits .2 Procurement negotiations .3 Records management system	
Outputs	.1 Closed procurements .2 Organizational process assets updates	

CHAPTER 13: Project Stakeholder Management

13.1 Identify Stakeholders

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Initiating	13.1 Identify Stakeholders	13.1 Identify Stakeholders
Inputs	1. Project charter 2. Procurement documents 3. Enterprise environmental factors 4. Organizational process assets	.1 Project charter .2 Business documents .3 Project management plan .4 Project documents .5 Agreements .6 Enterprise environmental factors .7 Organizational process assets
Tools & Techniques	.1 Stakeholder analysis .2 Expert judgment .3 Meetings	.1 Expert judgment .2 Data gathering .3 Data analysis .4 Data representation .45 Meetings
Outputs	.1 Stakeholder register	.1 Stakeholder register .2 Change requests .3 Project management plan updates .4 Project documents updates

New Inputs:

Business Documents: The business documents for this process include, but are not limited to:

- a. Business case (described in 1.2.6.1)
- b. Benefits management plan (described in 4.1.1.1)

Project Management Plan: Since the project management plan is not available when initially identifying stakeholders, once it has been developed, the components that can be helpful in this process include, but are not limited to:

- a. Communications management plan (described in 10.1.3.1)

- b. Stakeholder engagement plan (described in 13.2.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Change log (described in 4.6.3.3)
- b. Issue log (described in 4.3.3.3)
- c. Requirements documentation (described in 5.2.3.1)

Agreements: The parties of a procurement agreement are project stakeholders

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to:

- a. Questionnaires and surveys (described in 5.2.2.2)
- b. Brainstorming techniques (described in 4.1.2.2) including:
 - Brainstorming
 - Brain writing

Data Analysis: This includes stakeholder analysis techniques which can be used for this process, but are not limited to:

- a. List of stakeholders and relevant information
- b. Positions in the organization
- c. Roles on the project
- d. Expectations, attitudes, their level of support for the project and interest in information about the project
- e. Stakeholder stakes include but not limited to a combination of:
 - Interest
 - Rights (legal or moral rights)
 - Ownership
 - Knowledge
 - Contribution
 - Power/interest, power/influence or impact/influence grid
 - Stakeholder cube with multiple dimensions
 - Salience model
 - Directions of influence (upward, downward, outward, sideward)
 - Prioritization
- f. Document analysis (described in 5.2.2.3)

Data Representation: A data representation techniques that may be used in this process but is not limited to stakeholder mapping/representation:

- a. Power/interest grid, power influence grid or impact/influence grid.

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New Outputs:

Change Requests: During the first iteration of identifying stakeholders, there will not be any change requests. As stakeholder identification continues throughout the project, new stakeholders, or new information about stakeholders, may result in a change request to the product, project management plan, or

project documents. Change requests are processed for review and disposition through the Perform Integrated Change Control process.

Project Management Plan Updates: Components of the project management plan that may require a change request as a result of this process include, but not limited to:

- a. Requirements management plan (described in 5.1.1.2)
- b. Communications management plan (described in 10.1.3.1)
- c. Risk management plan (described in 11.1.3.1)
- d. Stakeholder engagement plan (described in 13.2.3.1)

Project Documents Updates: The project documents that may be updated as a result of this process include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Issue log (described in 4.3.3.3)
- c. Risk register (described in 11.2.3.1)

13.2 Plan Stakeholder Management changed to Plan Stakeholder Engagement

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Planning	13.2 Plan Stakeholder Management	13.2 Plan Stakeholder Engagement
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets 	<ul style="list-style-type: none"> .1 Project charter .2 Project management plan .3 Project documents .4 Agreements .5 Enterprise environmental factors .6 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Expert judgment .2 Meetings .3 Analytical techniques 	<ul style="list-style-type: none"> .1 Expert judgment .2 Data gathering .3 Data analysis .4 Decision making .5 Data representation .6 Meetings
Outputs	<ul style="list-style-type: none"> .1 Stakeholder management plan 	<ul style="list-style-type: none"> .1 Stakeholder engagement plan

New Inputs:

Project Documents: The project documents for this process include, but are not limited to:

- a. Assumption log (described in 4.1.3.2)
- b. Change log (described in 4.6.3.3)
- c. Issue log (described in 4.3.3.3)
- d. Project schedule (described in 6.5.3.2)
- e. Risk register (described in 11.2.3.1)
- f. Stakeholder register (described in 13.1.3.1)

Agreements: Coordination involves working with the procurement/contracting group in the organization to ensure contractors and suppliers are effectively managed.

New Tools:

Data Gathering: This includes techniques which can be used for this process, but are not limited to benchmarking, by comparing with information from other organizations or other projects that are considered to be world class.

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Assumptions and constraint analysis (described in 11.2.2.3)
- b. Mind mapping (described in 5.2.2.3)
- c. Root cause analysis (described in 8.2.2.2)
- d. Stakeholder engagement assessment matrix
- e. SWOT analysis (described in 11.2.2.3)

Decision Making: This includes techniques which can be used for this process, but are not limited to prioritization/ranking.

Data Representation: A data representation techniques that may be used in this process but is not limited to:

- a. Mind mapping
- b. Stakeholder engagement assessment matrix

New Outputs: None

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13.3 Manage Stakeholder Engagement

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Executing	13.3 Manage Stakeholder Engagement	13.3 Manage Stakeholder Engagement
Inputs	.1 Stakeholder management plan .2 Communications management plan .3 Change Log .4 Organizational process assets	.1 Project management plan .2 Project documents .3 Enterprise environmental factors .4 Organization Process assets
Tools & Techniques	.1 Communication methods .2 Interpersonal skills .3 Management skills	.1 Expert judgment .2 Communication skills inspection .3 Communication .4 Interpersonal and team skills .5 Ground rules .6 Meetings
Outputs	.1 Issue log .2 Change requests .3 Project management plan updates .4 Project documents updates .5 Organizational process assets updates	.1 Change requests .2 Project management plan updates .3 Project documents updates

New Inputs:

Project Management Plan: The components of the project management plan that would help in this process include, but not limited to:

- a. Communications management plan (described in 10.1.3.1)
- b. Risk management plan (described in 11.1.3.1)
- c. Stakeholder engagement plan (described in 13.2.3.1)

Project Documents: The project documents for this process include, but are not limited to:

- a. Change log (described in 4.6.3.3)
- b. Issue log (described in 4.3.3.3)
- c. Lessons learned register (described in 4.4.3.1)
- d. Stakeholder register (described in 13.1.3.1)

Enterprise Environment Factors: Factors that can influence this process include, but are not limited to:

- a. Organizational culture, political climate, and governance structure of the organization
- b. Personnel administration policies
- c. Stakeholder risk thresholds
- d. Established communication channels
- e. Global, regional, or local trends, practices, or habits
- f. Geographic distribution of facilities and resources

New Tools:

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge in the following topics:

- a. Politics and power structures in the organization and outside the organization
- b. Environment and culture of the organization and outside the organization
- c. Analytical and assessment techniques to be used for stakeholder engagement processes
- d. Communication methods and strategies
- e. Characteristics of stakeholders, stakeholder groups and organizations involved in the current project that may have been involved in previous projects
- f. Requirements management, vendor management and change management

~~**Inspection:** Inspection of project documentation and reports is used by the project team to ensure compliance to, or any variation from, stakeholder engagement activities~~

Communication Skills: Skills that can be used for this process include, but are not limited to:

- a. Communication competence
- b. Feedback
- c. Nonverbal
- d. Presentations

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Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Conflict management (described in 9.5.2.1)
- b. Cultural awareness (described in 10.1.2.6)
- c. Negotiation (described in 12.2.2.5)
- d. Observation/conversation (described in 5.2.2.6)
- e. Political awareness (described in 10.1.2.6)

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Ground Rules: Ground rules set the expected behavior for project team members, as well as other stakeholders, with regard to stakeholder engagement

Meetings: Types of meetings that can be used in the process include, but are not limited to:

- a. Decision making
- b. Issue resolution
- c. Lessons learned and retrospectives
- d. Project kick-off
- e. Sprint/iteration planning
- f. Status updates

New Outputs: None

13.4 Control Stakeholder Engagement changed to Monitor Stakeholder Engagement

Process Group	PMBOK 5th Edition	PMBOK 6th Edition
Monitoring and Controlling	13.4 Control Stakeholder Engagement	13.4 Monitor Stakeholder Engagement
Inputs	<ul style="list-style-type: none"> .1 Project management plan .2 Issue log .3 Work performance data .4 Project documents 	<ul style="list-style-type: none"> .1 Project management plan .2 Project documents .3 Work performance data .4 Enterprise environmental factors .5 Organizational process assets
Tools & Techniques	<ul style="list-style-type: none"> .1 Information Management Systems .2 Expert judgment .3 Meetings 	<ul style="list-style-type: none"> .1 Data analysis .2 Decision making .3 Communication Data representation .4 Interpersonal and team skills .5 Meetings
Outputs	<ul style="list-style-type: none"> .1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates .5 Organizational process assets updates 	<ul style="list-style-type: none"> .1 Work performance information .2 Change requests .3 Project management plan updates .4 Project documents updates

New Inputs:

Enterprise Environment Factors: Factors that can influence this process include, but are not limited to:

- a. Organizational culture, political climate, and governance structure of the organization
- b. Personnel administration policies
- c. Stakeholder risk thresholds
- d. Established communication channels
- e. Global, regional, or local trends, practices, or habits
- f. Geographic distribution of facilities and resources

Organizational Process Assets: Assets that can influence this process include, but are not limited to:

- a. Corporate policies and procedures for social media, ethics and security
- b. Corporate policies and procedures for issue, risk, change, and data management
- c. Organizational communication requirements
- d. Standardized guidelines for development, exchange, storage and retrieval of information
- e. Historical information from previous projects

New Tools:

Data Analysis: This includes techniques which can be used for this process, but are not limited to:

- a. Alternatives analysis (described in 9.2.2.5)
- b. Root cause analysis (described in 8.2.2.2)
- c. Stakeholder analysis (described in 13.1.2.3)
- d. Stakeholder engagement assessment matrix (described in 13.2.2.3)

Decision making: The techniques that can be used this process include, but are not limited to:

- a. Multicriteria decision analysis (described in 8.1.2.4)
- b. Voting (described in 5.2.2.4)

Communication: Techniques that can be used for this process include, but are not limited to:

- ~~a. Feedback (described in 10.2.2.3)~~
- ~~b. Presentations and other verbal communications (described in 10.2.2.3)~~
- ~~c. Stakeholder mapping representations (described in 13.2.2.3)~~

Data Representation: A data representation techniques that is used in this process includes but is not limited to stakeholder engagement

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Interpersonal and Team Skills: Skills that can be used for this process include, but are not limited to:

- a. Active listening (described in 10.2.2.6)
- b. Cultural awareness (described in 10.1.2.6)
- c. Leadership (described in 9.5.2.1)
- d. Networking (described in 10.2.2.6)
- e. Political awareness (described in 10.1.2.6)

New Outputs: None

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Asad Naveed has over 20 years of experience in various industries like Telecommunications, Electronics, IT in USA, Middle East, Canada and Pakistan. He is adept in System Engineering & Planning, Testing & Commissioning, Training & Teaching, Technical Support, Project Management, Troubleshooting, Documentation, Standards, Market Research, Product Comparisons, Technology Management, Vendor Management, etc.

He has contributed in a number of Fortune 500 and other Companies (Lucent Technologies, Alcatel, IBM, Celestica, HBC, KFUPM, PTCL, PMI and Telefocal) and widely travelled in Middle East, Europe, Asia, Africa, Oceania and North America.

Asad holds Master's and Bachelor's Degrees in Electrical Engineering from accredited universities. He is blessed with MEF-CECP, PMI-PMP and PMI-RMP Certifications. In addition, he has advanced certifications from Cisco, Sun and Lucent Technologies. He has strong qualities and skills in leadership, teamwork, analysis, negotiation and communication. He has provided trainings to a number of different clients in Africa, Middle East, Asia and Oceania. He is an expert trainer and prepares the student to pass PMP in first attempt. In addition, he has conducted a number of sessions for training on MS Project, Primavera, Contract Management, and related topics.

Currently he is engaged in multiple roles simultaneously. While contributing in telecom industry as General Manager, he is acting as Freelance trainer, providing PMP and Telecom Trainings, and acting as Visiting Faculty in CASE (Center for Advanced Studies in Engg), Islamabad, Pakistan.

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Erjola Mimani, PMP®, PSM I



Erjola Mimani is a leading project management consultant from Albania.

She started out as a software developer in the field of enterprise resource planning, moving to management and then to management consulting.

Erjola combines her strong IT background and extensive management experience with exceptional communication skills to help organizations implement complex projects.

She has overseen development and implementation of business solutions for major domestic and international companies across industries, including KPMG, Vodafone, Deutsche Telecom, Coca-Cola, Raiffeisen Bank.

In recent years, Erjola has also turned to training helping hundreds of professionals in Albania and the region improve their management skills.

Erjola has a bachelor degree in computer sciences, a master's degree in management. She is a certified PMP professional.

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Greta Blash, MA, PMP®, PMI-ACP, PMI-PBA, CSM



Greta Blash is a certified project management professional (PMP) who also holds additional PMI certifications as an agile certified professional (PMI-ACP) and a professional business analyst (PMI-PBA). She has extensive experience as an executive and consulting Information Technology (IT) professional, both domestically and internationally. She has provided consulting and training support in program, product and project management, consulting and training to global organizations world-wide. Her IT background includes data base design, data management and agile scrum, as well as customer-facing implementation requirements and conversions, including Business Intelligence and Customer Relationship Management (CRM) applications.

Greta has been active in PMI for over 10 years and has served on numerous local PMI chapter boards, as well as at a regional level supporting academic and military outreach initiatives. She has spoken at several PMI Global events, as well as being a frequent speaker for PMI chapters in Region 7. She most recently was selected as a SME on the new Business Analysis Body of Knowledge, as well as a key reviewer on the new foundational standards, including Program Management, Project Management, and Agile. She has just published the second edition of the book she jointly wrote with her husband, Steve Blash, *The Basics of Good Project Management*, based on a webinar jointly presented by the Orange County PMI chapter and Cal Southern University, available now on YouTube.

Greta has an undergraduate degree in math and music and a graduate degree in Information Management. She has taught high school math, as well as the full graduate project management curriculum as part of a Masters of Project Management degree program. In her spare time, she enjoys compiling her extensive family history, traveling internationally, as well as being with her two daughters and four grandchildren.

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Jason Saetrum, PMP®, CSSBB, IASSC ATA™, MCP, Project+ Certified



With over twenty-one years of experience, Jason Saetrum has managed teams of more than 600 hundred employees across globally dispersed locations. His professional experience includes IT, Contact Centers, Customer Service, Mining, Business and Operational design, Consulting, Training, and Investment Banking among many others. Currently, he has been busy with training certification courses on PMP, Lean Six Sigma Green and Black Belts, and Microsoft Office applications. In addition, he spends his time outside the classroom consulting and writing curricula for various training companies, including his own, Mental Steel, LLC.

You will soon find his new, direct to consumer material on Amazon, MentalSteel.com, and on InstructorSeries.com.

Jason holds active certifications in PMP® from PMI, Certified Six Sigma Black Belt (CSSBB) and Green Belt (CSSGB) from the American Society for Quality (ASQ™), Microsoft Certified Professional (MCP) in Project 2013, Project+ Certified from CompTIA, and he is an Accredited Training Associate (ATA™) with the International Association for Six Sigma Certification (IASSC).

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Kavya Gupta, PMP®



Kavya Gupta is a certified project management professional (PMP) with an extensive experience in client servicing focusing particularly on leading operational improvement projects aiming to provide structured guidance in assessing the value of the customer service, ensuring a successful outcome for every client she works with. She's also an active member of Project Management Institute (PMI).

Much of Kavya's professional experience has come from working with dynamic range of industrial domains such as Real Estate Management, Information Technology, Banking, Insurance and Telecommunication where she developed superior skills along with an outstanding commitment to customer service. Armed with these attributes, she has an attention to detail, excellent rapport-building skills and the vitality and energy she brings to each client engagement and is

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In her spare time, Kavya enjoys spending time with her family & friends, reading, cooking and seeking adventure in the outdoors. To know more about her, feel free to directly get in touch with her by sending her an email.

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Oliver Yarbrough, M.S., PMP®



Oliver Yarbrough is a speaker, author, trainer, and leading expert in project management, PMP® Exam Prep, and growth strategies to raise competitiveness.

His professional career includes positions with Fortune 500 companies such as Lucent Technologies, Staples, and Sprint, along with his own successful business ventures. Oliver's accolades include maintaining an internationally recognized Project Management Professional (PMP®) certification. Additionally, he has been featured in the Atlanta Business Chronicle's "People on the Move."

Recently, he completed his term as Vice President of the National Contract Management Association (NCMA) – Atlanta Chapter. Oliver is also an active member of the Project Management Institute (PMI®).

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Samuel Odemo, B.Tech, PMP®



Samuel Odemo is an exceptional Facilitator and Project Controls Specialist.

He holds a Bachelor in Technology (B.Tech) in Industrial Mathematics and recently enrolled in the WQU Master of Science in Financial Engineering (MSFE) program.

Samuel has over 10 years' experience working with various private and corporate organizations in Nigeria.

A Strategic Projects Controls Professional with experience in planning and progress reporting as well as analysis and simulations of new schedules required to ensure timely and successful project delivery.

As part of his professional qualification, Samuel is a certified Project Management Professional (PMP) by the Project Management Institute, USA. He is working towards certifications in Risk and Scheduling Management.

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In addition, he has Membership and Certification in Planning & Scheduling with the Guild of Project Controls.

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Steve Blash, MA, PMP®, PMI-ACP



Steve Blash is a senior I. T. consultant at Facilitated Methods, who is a provider of training and consulting in agile, business analysis and project management. He is a certified Project Manager Professional (PMP)® and a Certified Agile Practitioner, (PMI-ACP)® with exceptional Information Technology knowledge and has extensive agile, business analysis and project management experience managing all aspects of large complex projects. His roles on agile projects have been from managing a project to performing the role of an agile coach and scrum master. Areas of expertise include business agile methods, requirements analysis, lean, business intelligence, CRM, web analytics, IT infrastructure and wireless technology.

He has written numerous articles in ProjectTimes.com, BATimes.com and AllIPM.com as well as for the local PMI chapter's newsletter. He also has a YouTube video on managing conflict, given several webinars and is co-author of the Basics of Good Project Management book. He is the past president of the Southern Nevada (Las Vegas) PMI chapter (PMI-SNC) and has participated in, and spoken at a number of PMI Global events, as well as a frequent speaker for Region 7 chapter meetings and conferences.

Steve has an undergraduate degree in Economics and a master's degree in Information Management. He has taught the full graduate project management curriculum as part of a Masters of Project Management degree program. In his spare time, he enjoys his garden, traveling internationally, and spending time with his two daughters and four grandchildren.

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Varun Anand, PMP®, CSM



Mr. Varun Anand is an internationally renowned PMP trainer with more than 10 years of extensive work experience as a Program/Project Manager. His expertise encompasses a dynamic range of industrial domains such as E-Commerce, Automobile, Non-Profit, Mortgage, Infrastructure, Education, Insurance and Telecommunication. He is a business strategist who has managed a wide variety of multimillion-dollar projects focused on aligning business goals with technology solutions to drive process improvements, competitive advantage and bottom-line gains. Varun is also a Certified Scrum Master with extensive work experience with Agile/Scrum methodologies.

Varun's academic career started off with a Bachelor's in Engineering with a Computer Science major from Apeejay College of Engineering (Haryana, India), followed by a Masters in Engineering Management from University of Maryland, Baltimore County (Maryland, USA). Varun's professional career involved companies such as eBay, American Association of Retired Persons (AARP), Infosys and Genpact, where he became an asset for corresponding project teams by adding value through his profound expertise. Through his knowledge and a passion for education, he has trained thousands of people and has consequently gained wide respect in the project management industry.

Varun's extroverted personality is expressed in his day-to-day attitude of living life to the fullest. Since childhood, he has always been passionate about cricket and continues to play for different sports club in the US. Apart from being exceptional at PMP training, he is an ardent fan of watching movies and travelling with friends. To know more about him, feel free to directly get in touch with him by sending him an email.

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